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ENGINEERING FINANCE COMMERCE

VOL. XXXV SHANGHAI, MAY, 1939 No. 5

FAR EASTERN CROSS-CURRENTS

Culminating a series of successful performances, the Takarazuka girls' opera troupe on May 14 gave the ninth and final presentation of its show in the San Francisco Opera House.

The farewell performance, was attended by a capacity crowd, of which approximately two-thirds were Americans.

Members of the troupe visited the Golden Gate Exposition grounds and then entrained from Oakland for New York.

Praising the troupe's premiere at the San Francisco Opera House, a reviewer of the *San Francisco Examiner* declared that the Takarazuka girls " presented about the best entertainment which has come this way in a long time. It is something new under the sun and there is no way of classifying it."

The journal discovered in the performance " a composite of dancing, ancient and very modern, singing, drollery, vaudeville, ravishingly pretty standards of beauty and opulence of costume and scenery. Takarazuka is a delightful growth grafted upon the older Japanese civilization, a mixture of ancient culture and a modern youth movement."

" It is as if the oldest and wisest of the Empire had sat in conference with the youngest, gayest and brashest and the latter declared, ' Things have changed since the American Perry landed here and we've been around,' " the reviewer continues. To which their elders replied, " All right, go ahead. Shuffle and shag, truck and swing and sing through microphones. But keep the cherry blossoms and chrysanthemums, silks and brocades, the incense of our temples and arched bridges, our sword dances and wheeling parasols and we'll submit to your new ideas."

Another reviewer said that the performance at the War Memorial Opera House " might be likened to a rare combination of ancient dance, Kabuki drama, folk song and a Japanese edition of the Ziegfeld follies. It was an enchanting spectacle."

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An I.N.S. dispatch of May 11 quotes an official at Washington as saying that the Administration is considering an embargo on American exports to Japan of petroleum, scrap iron and copper.

Government military experts have reported, he said, that the position of Japan's forces in China would be hampered considerably by the stoppage of these supplies, leading to belief that in this way Japan could be induced to accept adjustment of Asiatic questions in an international conference. Such a conference was proposed in the United States note delivered to Japan on December 31, which Japan has not yet answered.

It is indicated in official quarters that the imposition of such an embargo may hinge on what Congress does about neutrality legislation and Senator Key Pittman's resolution empowering the President to apply economic sanctions against Japan.

Unless legislation is enacted prohibiting sanctions against a single belligerent nation, it is believed in the same quarters that President Roosevelt may move in the summer to extend the current moral embargo on aircraft for Japan to the above commodities.

It is pointed out that such an embargo would fulfil the President's advocation, in his message opening Congress in January, of " measures short of war " to uphold the sanctity of treaties and international law.

Officials consider the chances of Congressional enactment of a ban on sanctions against one country or group of countries to be very slight but they are convinced that the President would veto any anti-sanction bill submitted to him. His veto would force its proponents to muster a two-third majority in both Houses to write the prohibition into law.

Studies of Japan's war economy by the State, Commerce and War Departments in conjunction with the Tariff Commission are said to disclose that American minerals constitute Japan's life line for prosecution of the hostilities in China.

The effectiveness of an embargo on petroleum, scrap iron and copper would depend on a prior settlement of the oil controversy between the United States and Mexico over the latter's confiscation of American-owned oil properties. The Administration is said to be aware that without a settlement of this Japan could circumvent the embargo by purchasing oil and copper from Mexico's inexhaustible quantities of both.

An analysis of the European situation has convinced the Administration that Japan could get none of the three commodities there. It is assumed that Great Britain, the Netherlands and Belgium would co-operate in the embargo on oil and copper.

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Because of the great influx of Japanese tourists and Chinese laborers, which in recent months has all but bogged down railway service, the South Manchuria Railway Company shortly will inaugurate a " boxcar steerage " class of transportation to relieve the pressure, says a Mukden report to the *Asahi*.

Regular passenger trains in the near future will carry a string of fourth-class carriages in addition to the regular ones of first, second and third class. These simply will be remodeled freight cars, fitted with windows and upholstered with straw mats. Fourth-class passengers will pay half the fare charged at present for third-class transportation in Manchoukuo.

The exalted boxcars will be similar to the " 40 and eight " voitures of World War fame, except that the passengers will not be obliged to share their traveling accommodations with eight mules, as did the doughboys in France.

The South Manchuria Railway Company points out that Manchoukuo of late has become increasingly attractive to Japanese tourists and prospective settlers.

To cope with the influx, the Manchoukuo Government recently required all Japanese visitors to obtain special permits from the Japanese Government before seeking entrance. The move did little to check the swarm of travelers, however, which taxed the facilities of passenger trains and river boats on the Continent.

The railways also have had to handle an annual stream of 900,000 or more Chinese laborers from Hopei and Shantung provinces, needed to build up the manpower for operation of the five-year industrial plan.

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Finance Ministry authorities, who had counted on easy and speedy collection of gold articles from the people, to bolster national finances, instead are finding the going extremely difficult, reports the *Chugai Shogyo*.

The calling in of gold coins, bars and ingots is a relatively simple matter, for the weights and units are identical, and the payment, therefore, is the same in all cases. The Ministry was highly gratified with its survey of such gold holdings last fall.

When the authorities decided to send out forms requiring the people to list all gold articles in their possession, such as watches, chains, lockets, stickpins and ornaments, it was a far different matter, however. They have discovered that there is an extremely great variety as to the actual gold content of such articles. Hence, it is impossible to estimate accurately just how much gold is available to call, even after questionnaires are filled out and returned properly. It will be even harder, and involve more red tape, to pay for the gold after it is collected, for weighing the articles will not determine the value. They must be broken up and melted first to find the actual gold content.

The question of rare ornaments is another serious problem. It appears, however, that the general policy will be to pass up articles whose ornamental or antique value exceeds the actual cash value of the gold they contain, the newspaper says.

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Information received from Nanking by the *Yomiuri* regarding the purported new pact between the Soviet Union and China, states that part of the price demanded by the Soviet Union for lending assistance to China in the hostilities with Japan is that Moscow must be consulted before mediation efforts in the conflict are proposed by any third Power.

Other concessions to the Soviet not reported heretofore, according to the *Yomiuri*, are the absolute suppression of the peace faction in the National Government and in the section of the country it controls, and that the equipment for and, treatment of the Central Army, the Communist Army and the provincial fighting forces be identical. A North-west special administration district will be created, embracing the provinces of Shensi, Kansu, Ningsia and Sinkiang, with Luchow as the capital and General Mao Tse-tung as chairman and chief administrating official of the district. The Soviet will be permitted to develop and exploit the resources of the district and only members of the Communist Army will be garrisoned there. A Soviet general also is to be stationed there as military representative.

Soviet experts also are to be engaged as military instructors to train soldiers and aviators, and air and land lines will be established between Sian and Moscow, by way of Lanchow, Hami and Tihwa.

In return for the Chinese concessions, which reportedly were approved by General Chiang Kai-shek in Chungking last month, following reception of a report from Mr. Sun Fo, who has been negotiating in Moscow, the Soviet Union will provide unlimited material and technical assistance to China.

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Completing its 8,500-mile goodwill flight from Berlin in an even dozen days, the trimotor Junkers airliner Hans Loeb of the Lufthansa Aircraft Company, piloted by Baron C. A. von Gablenz, arrived at the Haneda airport at 2.03 o'clock on May 3, several hours ahead of schedule.

The giant airliner averaged 155 miles an hour on its 650-mile flight from Taihoku, leaving the Formosan capital at 3.08 o'clock in the morning, after a 14-hour rest, and stopping at Fukuoka at 8.55 o'clock for an hour and 10 minutes to refuel.

As the goodwill plane passed over Osaka at 12.15 o'clock, it was joined by a German-built Heinkel plane of the Japan Airway Company and an *Asahi* newsplane, which escorted the airliner to Tokyo.

A large crowd, including high Government officials, aviation executives, representatives of the German Embassy and 300 German residents began assembling at the recently remodeled airport at noon. The airport was decorated with Swastika and Rising Sun flags. The airliner and its escort appeared from the south-west at 2 o'clock sharp and circled the airport once before coming in for a perfect landing.

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Mr. Eckersley (Manchester, Exchange, U.) reports the *London Times*, asked the Secretary of State for War whether he was aware that certain units of the Army serving abroad had been issued with pyjamas of Japanese manufacture ; and would he take immediate steps to see that in future only articles of British manufacture are issued to all British troops.

Mr. Hore-Belisha.—Pyjamas for troops, at all stations abroad, other than the Sudan, are made of British materials.

It is the practice to supply articles of British manufacture whenever available and suitable, unless the difference in price is found to be excessive, and I will look again into the provision of sleeping suits in the Sudan.

Mr. Eckersley.—Does the Minister realize that this supply of pyjamas to troops in the Sudan has given rise to great concern—and is not a help to recruiting ?

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The Government desires to avoid Germany's experience in developing friction with other countries over persecution of Jews, Foreign Minister Hachiro Arita told a conference of prefectural governors in discussing enforcement of the new regulations on the entry and residence of aliens.

"It is not our policy particularly to persecute Jews," the *Nichi Nichi* quotes him as having said. "And so long as they do not violate the stipulations against Communism or espionage, they should be treated as any other foreigners. We wish to avoid any development like friction with other countries over persecution of Jews such as Germany has had."

The newspaper says this statement is considered "noteworthy in connection with the policy of the army not to obstruct the flow of foreign capital into the occupied areas in South and Central China."

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Repairs having been completed by Japanese army engineers, who co-operated with officials of the Peiping regime, a canal linking Tientsin with Paoting, on the Peiping-Hankow Railway, by way of Lake Paiyangtien, was opened recently to traffic. A group of more than 30 ships of the China Inland Navigation Company, which left Tientsin on May 1, arrived at Paoting on May 8, one day later than scheduled, the first to pass through the reconstructed waterway.

It is learned that the China Inland Navigation Company is conducting a survey of the Tzeya River and the South Canal for two new projected waterways.

The completion of these canals will facilitate communications between Tientsin and Lincheng, on the Tientsin-Pukow Railway in southern Shantung Province, by way of Shihkiachwang, between here and Sinhsiang, on the Peiping-Hankow Railway in northern Honan Province, by way of Tehchow and Lintsing, northwestern Shantung Province, and between the latter town and Hsuchow by way of the Grand Canal.

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The development last century of Japanese shipping has an almost musical-comedy atmosphere. An article in "The Navy" tells how princes handed over boats for nothing because they were too proud to take money.

"Until 1854, when she made her first treaty with a Western Power, Japan had of her own desire been for nearly three centuries completely isolated from the comity of nations, and was governed on the lines of the feudal states existing in Europe's dark ages. Consequently, such shipping as she possessed consisted of a few small junks which seldom voyaged out of sight of land. Indeed, so determined were Japanese rulers to have no intercourse with foreigners that the law compelled all junks to be built with wide open sterns, so that the vessels would be bound to founder if their crews disobeyed orders and attempted to take them overseas."

Then Japan came into contact with modern nations, and decided to westernize herself, and have a merchant navy. But for a number of years her sailing ships were too small to compete with those of other nations. "Japan's shipping was in the hands of the *daimio*, or petty local princes, who ruled the country in feudal days, and the majority of these noblemen looked upon the running of a ship more in the light of a hobby than as a commercial proposition.

"Ultimately, a few of the more venturesome amongst the *daimio* decided to run steamers, but, the actual construction of the vessels being beyond the country's capacity, they were compelled to purchase them abroad. In 1870 the first Japanese steamer service was inaugurated, and was soon followed by others. Somewhat to the surprise of the sponsors, the ventures showed a profit ;

and thereby arose fresh complications. For according to the cumbersome Japanese etiquette, it was impossible to combine princely dignity with the mundane calling of shipping, which was the province of the then despised mercantile community.

"So the *daimio* preserved their dignity by handing over their ships to companies of merchants. In many cases the noble owners were too proud to ask any payment for the vessels, with the result that a number of Japanese shipping companies began business with the initial advantage of having their fleets provided for them."

Japan began to indulge in military adventures overseas, and needed transport. So the Government purchased steamers from Europe and America. "The expedition to Formosa in 1875, the war with China in 1894 and with Russia in 1904-5 all resulted in large additions to the Japanese mercantile marine." At the end of each war the ships were handed over to shipping companies because the Government, like the *daimio*, was too proud to traffic in transport.

At the same time shipping companies, having received substantial Government grants, began to purchase old steamers and man them "with crews satisfied to work for a few shillings a month. With their patched-up ships and cheap crews, Japanese owners were able to run amazingly economical services, and by the eighties of last century had secured for themselves a prosperous niche in certain classes of the Pacific trade."

"Further impetus was given to Japan's shipping industry during the Great War, when the ravages of the German submarine campaign were overtaxing the capacity of even the vast shipbuilding organizations of Great Britain and the United States. Japan's great distance from the chief theatres of hostilities restricted her naval and military participation in the Allied cause, and much of her aid consisted in the transport of stores.

"Not surprisingly, therefore, Japanese shipping enjoyed a tremendous boom in the years 1914-1918. Besides launching ships for her own use, Japan actually had yards constructing a large number of cargo vessels for the United States Shipping Board. . . . To-day there are over 4,475,000 tons of merchant shipping under the Japanese flag, a figure exceeded only by Great Britain and the United States."

* * *

Rangoon, capital of Burma and western terminus of the new Burman-Yunnan highway, is a beehive of activity these days, for it is now the most important source for arms and material supplies to the National Government of China from the outside, says a Singapore dispatch to the *Nichi Nichi*, quoting a foreigner who has just visited the Burmese capital.

Work goes on day and night, Sundays included, the report states, and the city is overrun with munitions salesmen and agents of the National Government. Activity is particularly intense at present, probably because the rainy season, which will halt traffic on the overland route for several weeks, is at hand.

The dealers in arms and munitions, American and European agents, are making the Strand Hotel their headquarters. The hotel is filled to capacity, and rooms are not available unless reservations are made far in advance.

"Thousands of Hindu and Burmese coolies are employed to unload the cargoes of war materials from foreign vessels, which arrive almost every day. The Burmese people as a whole are opposed to the utilization of their territory as a route to supply arms to the Chiang Kai-shek regime.

"Most of the cargo landed is packed in big cases. These may contain machine-guns, aircraft parts or ammunition. Sometimes there are huge crates and cases stamped with the address of a large foreign automobile manufacturing company. It is evident that these contain military trucks.

"As Rangoon has no quays, all cargo is transhipped to lighters."

* * *

Outlining the future foreign policy of the Australian Commonwealth, Prime Minister Robert Gordon Menzies, in his first public address since he assumed office in April told 3,000 persons assembled in the municipal auditorium at Sydney that the Commonwealth Government will continue to foster friendly relations with Japan.

There is no reason, the Prime Minister declared, why Australia should contend with Japan.

Denying that Australia will follow a policy of isolationism, Prime Minister Menzies asserted that the Commonwealth Government will follow a policy of full co-operation with Great Britain.

* * *

A Domei dispatch from Hongkong reports that although official circles and the press are reticent, a number of terroristic incidents have broken out in Chungking. A decapitated head found on a road in the suburbs of Chungking several days ago is reportedly that of a certain Lu, who allegedly took part in the attack on the residence of Mr. Wang Ching-wei, ousted vice-president of the Kuomintang, at Hanoi on March 21, when Dr. Tseng Chung-ming, his secretary, was assassinated by mistake. It is stated that Lu was killed by members of the Blue Shirts Society to prevent the leakage of the names of those who were behind the Hanoi incident.

It is also reported that a terrorist named Sieh, who allegedly took part in the assassination several months ago of Mr. Tang Shao-yi, magistrate of Chungshan Kong, Kwangtung Province, was also attacked in Chungking at the Municipal Hospital, where he had been receiving medical care. However, he is a said to have succeeded in killing his would-be assassin.

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Under the laws of the Reformed Government of the Shanghai region a new bank was established on May 1. The bank is called the Hua Hsing Commercial Bank, capitalized at Yuan 50,000,000, and authorized to issue notes, which are freely converted into foreign exchange. Mr. Chen Chin-tao, Minister of Finance of the Reformed Government, was appointed governor, while Mr. Isoichi Washio, a former Director of the Central Bank of Manchu at Hsinking, was appointed Vice-Governor.

The capital of the new bank is fully paid up, the Reformed Government subscribing Yuan 25,000,000, and six Japanese banks providing the remainder. The bank's notes are designated as legal tender in areas governed by the Reformed Government. They are acceptable for all official payments and banking and business transactions, with the exception of those pertaining to Maritime Customs dues.

It may be contended that there are too many banks in Shanghai and a new institution is not desirable. However, there were no Chinese banks operating in the territory under the jurisdiction of the Reformed Government, and commercial and industrial rehabilitation could not be realized unless the Government established a new commercial bank.

The value of the new notes will be maintained equal to that of the national currency, while the bank is prepared to sell foreign currency against its notes without restriction. Hence it will be seen that the new issue is totally different from the Federal Reserve Bank notes in North China, because the new issue is not linked to the yen, but to the national currency.

Whether the value of the new issue will always follow the value of the national currency is not explained clearly by the authorities concerned. It may be an extremely delicate question which the bank will be unable to determine beforehand. It is believed, however, that with the exception of cases where the national currency should register violent appreciation or depreciation, the bank should endeavor to obtain a rate for its own notes parallel to the fluctuations. Should the national currency depreciate greatly, as a result of the ill-will, or financial stringency of the Chiang Kai-shek regime, the new currency will automatically gain popular confidence and *serve the public by giving evidence of its stability*, according to Mr. Masaji Yoshida, for many years Manager of the Shanghai Branch of the Mitsubishi Bank and former Chairman of the Japanese Chamber of Commerce and Industry in Shanghai.

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Under instruction from Tokyo, Mr. Mamoru Shigemitsu, Japanese Ambassador in London, visited Lord Halifax, British Foreign Secretary, on April 27, in order to convey the grave concern of the Japanese government over the reports that Anglo-Soviet co-operation would be extended to the Far East, it was reported by the *Kokumin Shimbun* of Tokyo.

Lord Halifax is alleged to have replied that Britain would never commit herself to any joint action with the Soviets in the Far East.

In the meantime, the European policy of Japan is reported to have been agreed upon by the Cabinet Ministers after repeated sessions of the Five Ministers' Conference. Mr. Hachiro Arita, Foreign Minister, made a report on the European situation on May 5, before a regular meeting of the Cabinet. The Foreign Office spokesman was subsequently subjected to a barrage of pointed questions by the Press on Japan's policy on the European situation. He declined to comment on the rumor or supposition regarding the alleged military alliance between Japan, Germany and Italy, but said that "Japan had her own, independent foreign policy." This policy, he continued, as indicated from time to time by the Premier and the Foreign Minister, antagonized neither the democratic camp nor the totalitarian bloc.

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On July 11, at 3 p.m., one of the most significant events in the history of the Japanese merchant marine will take place. It will mark the departure of the Osaka Shosen Kaisha's new luxury liner *Argentina Maru*, 13,000 tons gross, on her maiden voyage which will take her around the world.

Launched on December 9, of last year, at the Mitsubishi Dockyards at Nagasaki, the ship will be the first unit of a splendid fleet to be made entirely of domestic materials and by Japanese builders. The final fittings and furnishings are expected to be completed by July and the maiden voyage is scheduled for July 11.

The beautiful new liner is 166.3 meters long and is powered by two Mitsubishi Diesel engines having a combined power of 16,500 h.p.

The special feature of the great vessel is the speed of 22 knots. This will enable her to cut by 11 days the time it takes the *Buenos Aires Maru*, present queen of the Shosen fleet, to go around the world which is three and a half months.

On her maiden voyage the *Argentina Maru* will leave Yokohama on July 11 for Kobe, leaving the latter port on July 15 westward. The ship will then touch at Capetown, South Africa, after which it will go to South America. After a stop at Los Angeles, the *Argentina Maru* will return to Japan on October 17.

The *Argentina Maru* is luxurious to the nth degree, employing all that is the best in Japanese artistry. Accommodations are provided for 101 first class, 136 special third class, and 674 third class passengers.

In the staterooms and public saloons, there will be used many Japanese ancient art objects. Special suites will be given names such as "Fuji," "Bushi," and "Sakura."

On the boat deck will be a beautiful large swimming pool with a sand beach and sun umbrellas. It will truly be a floating hotel.

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Conditions in the Soviet Union are the worst known in ten years making it extremely unlikely that it will figure in any immediate line-up against Fascism, in the opinion of Mr. Roy Howard, chairman of the executive committee of the Scripps-Howard newspapers, expressed in a long dispatch from Paris in March.

The dispatch, which was syndicated throughout the United States, reports Mr. Howard's observations on the Soviet Union based on five weeks of travel in Europe, during which he visited the major capitals and had private talks with Prime Minister Neville Chamberlain of Great Britain, Premier Edouard Daladier of France, Foreign Minister Joachim von Ribbentrop of Germany, Foreign Commissar Maxim Litvinov of the Soviet Union and many other important figures, both official and private. The text of the report, as published, follows:

"Russia, if she can be judged by Moscow, which is her show window, is whirling in another downward spiral of the type which, on several previous occasions, has interrupted the course of the oldest of modern dictatorships.

"Political, military and economic leaders admittedly running into the thousands have been executed, exiled or liquidated in the past two years. The result has been military disorganization, a stalling of industrial production, fear, furtiveness and an avoidance of foreigners.

"Spies and informers infest Moscow life. Foreign Embassies maintain staffs of electricians of their own nationalities to search the premises periodically for O.G.P.U. dictaphones, and plenty have been found. This is nothing new, but present conditions are the worst in ten years.

"Airplane production, according to foreign military intelligence, continues to be numerically great but of low efficiency. Most planes are said to be copies or slight modifications of American or European models.

"Heavy industries bogged down when they attempted to dispense with foreign engineers and managers. Commodity production has also failed miserably, and the few commodities available come into stores where the politically influential new aristocracy are the first to call.

"The failure of Russian economy to produce even sufficient necessities is chargeable in part to the Russians' inexperience and lack of aptitude for industrial production, in part to the concentration of the country's major efforts on building up the Red Army.

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The *Mining Journal* reports that the Manchurian Gold Mining Co. is planning to increase its capitalization from Y15,000,000 to Y50,000,000 in preparation for a large-scale expansion of operations. Gold production by this company, which has a monopoly in Manchuria, expanded at a fast rate in recent years, contributing substantially to the war chest of Japan. Output figures from the year of establishment down to 1938 are: 1934 Y541,242; 1935 Y3,670,-848; 1936 Y10,024,136; 1937 Y11,970,136; 1938 (estimated) Y13,000,000. Though Japan no longer publishes mineral output figures, it is estimated, on the basis of known specie reserves and known gold shipments abroad, that production of newly mined gold in 1938 remained far behind the expectations of the five-year planners, who envisaged as a final goal an annual production of Y500 million (£30 million).

Actual output for Japan with Formosa and Korea is estimated at Y180 million, at the official Japanese buying price, or approximately Y215 million (£12.7 million) on the basis of the American price of $35 per oz. Reasons for the disappointing development of production were (1) the acute shortage of carload space and shipbottoms, (2) the shortage of mining machinery, and (3) lack of electric power in vital locations. All other mining operations were affected by rather the same shortcomings. It also seems that the smuggling of gold from Korea has again gained momentum. It is estimated that the visible production available to the Government (which last year established a gold purchasing monopoly) was thus reduced by Y30 million.

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The *Rangoon Times* understands that an aerodrome has been in course of construction for some time past—and has nearly been completed—at Lwewaing Village about forty miles inside Chinese territory from the Burma-Chinese boundary. It is stated that the construction of this aerodrome (which also includes a workshop) has been carried out by Chinese labor under the supervision of Americans who are said to be representatives of aeroplane manufacturers.

It is also understood that three special lorries have arrived in Namkham from China. They are said to be *en route* to Bhamo to transport two American fighting planes and spare parts which are being sent out for demonstration and training purposes: and that these three lorries have also brought to the new aerodrome 40 Chinese airmen who will be trained in the technicalities of these American planes so that when the large consignment of similar planes which have been ordered arrive and have been assembled at the Lwewaing aerodrome the Chinese Government will have airmen ready to fly them away.

* * * * *

A Chinese Communist leader in Hongkong claims to have learned that Mr. Sun Fo, President of the Legislative Yuan of the Chinese Government, now in Moscow, has sent a telegram to General Chiang Kai-shek, at the behest of Mr. Josef Stalin, inviting him to fly to the Soviet capital to conclude a military alliance.

If the report is true, says the *Nichi Nichi*, previous reports alleging the existence of a secret Sino-Soviet pact have been premature. The telegram is said to have been received by General Chiang in Chungking on May 5.

In the light of this, the *Nichi Nichi* believes the bid from Mr. Stalin might be a ruse to give the Chinese Communists a chance to wrest the leadership of the nation away from the Kuomintang Government during the absence of General Chiang.

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The United States Maritime Commission has announced the projection of a new $100,000,000 shipbuilding program for 1939. The program calls for the building of three trans-Pacific liners for service on routes thus far unspecified.

Early next year, the commission intends to concentrate on West Coast shipping problems.

The spokesman for the commission said that bids would be invited for the proposed trans-Pacific liners within six months. It is understood that the plans are for ships capable of carrying at least 1,000 passengers and equipped with every conceivable safety device. He said that it had not yet been decided exactly on which trans-Pacific service the new liners will be placed.

Things to Worry About

An Issue in Commons

London, May 25.—The question of the excessive length of speeches in the House of Commons was raised to-day by Sir Charles Edwards, Labour member for the Bedwelty division of Monmouthshire, and by Captain Victor Cazalet, Conservative member for Chippenham division of Wiltshire.

The two members complained of the "loquacity" of well-known politicians, which they alleged, practically meant the denial of free speech to the majority of members.—*Reuter*.

* * *

Those Frugal Italians

Rio de Janeiro, May 18.—International barter took a new twist to-day with the report that Italy and Brazil are about to negotiate a deal involving a football player for coffee.

The president of a Brazilian athletic club said he was attempting to sign a player now under contract to a football club of Genoa, Italy. He said the Italians were ready to release the man but wanted a certain amount of coffee to boot.—*United Press*.

* * *

Flash:—News From Wyoming

The always-alert *Shanghai Evening Post & Mercury* reports that Mr. Nelson Trusler Johnson, the United States Ambassador to China, returned from a vacation in the States aboard the steamer *President Coolidge* on May 24. "All we talked about in Wyoming," the Ambassador confided to an inquiring reporter from the newspaper, "was sheep and cows and horses. The lambing season there was fine."

* * *

Excitement at Geneva

Geneva, May 19.—Only two political problems are set down on the agends of the 105th session of the League of Nations Council, which opens on Monday.

The first question is that of China's appeal to the League, which will permit the delegates to review the Far Eastern situation as a whole.

The second is Finland's and Sweden's requests for League ratification of an agreement, already reached with signatories of the 1921 Convention neutralizing the Aaland Isles, for the remilitarization of these islands.—*Havas*.

* * *

Handicaps for the Law

Peiping, May 23.—Mr. Chu Sheng, Minister of Justice in the "Provisional Government," has issued a circular order to presidents of high courts and chief prosecutors urging them to be honest and lawabiding citizens.

They are also asked to exercise strict discipline over those working under them.—*Reuter*.

* * *

Alluring Camouflage

Strollers on the Garden Bridge in Shanghai late in May noticed that the big granite structure on Whangpoo Road that houses Embassy offices and Consulate-General of the Russian Soviets was being refurbished externally. They were painting the conical roof of the dome on top of the building a vivid emerald green. What this may portend is questionable. It is held to be practically certain, however, that the Irish in Shanghai will not be misled.

* * *

And Here is a Problem

Under date of May 19 a correspondent sends an S-O-S to the Editor of *The North-China Daily News* of Shanghai, thus, "Could any of your readers inform me what to do about a rubber raincoat that is getting sticky ?—*Stuck*."

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Roosevelt Thought of it First

Belgrade, May 19.—M. Gregor Gafencu and M. Alexander Markovich, respectively Rumanian and Yugoslav Foreign Ministers, will meet on Sunday, May 21, on a boat in the middle of the Danube, the semi-official Avala news agency confirmed here to-day.—*Havas*.

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And Still It Rains

Kobe, May 23.—The Commerce Department has decided to standardize the size and quality of umbrellas throughout the country and manufacturers in Tokyo and Osaka have been invited to Tokyo to attend a conference in this connection in the near future.

An investigation has revealed that over 200 kinds of umbrellas have hitherto been manufactured in this country.—*Fleetnews*.

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How Crude, Those Americans!

Washington, May 18.—The State Department sent out Notes to-day to the various Governments concerned to remind them that War Debt payments are due on June 15.—*Havas*.

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When the Tom-Tom Sounds

Cologne, May 19.—"In England to-day, they are surprised because we speak as openly as we do. But we speak so openly because for three years we gave up eating butter, beef and pork and built fortifications, which now protect our frontiers," the Propaganda Minister, Dr. Joseph Goebbels, stated to-day in a broadcast address on the occasion of a Nazi Party demonstration.

"To have less butter and roast veal does no one any harm. But we were able to build cannons for the time when we could speak altogether openly with the world," he said.—*Havas*.

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New Menace in Arizona

Yuma, Ariz., May 17.—Determined to be competitor for some of Yuma's lucrative marriage business, Justice of the Peace John A. Provorse painted this sign on the side of his office at Salome: "No waiting, no delay. Get married here to-day."

Provorse calls himself the "Desert Justice" and hopes his "Gretna Green" rhyming will place him in direct line for the marriage overflow from California.—*United Press*.

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Why Call a Taxi

Bounding out of bed at 6 a.m. and going through the daily dozen is not the secret of a healthy constitution, according to Dr. Donald Matthews, biology professor at Westminster College, New Wilmington, Pa. "A brisk walk in the open air is worth 20 gymnasium workouts," Dr. Matthews believes, while strenuous daily exercise "probably does more to break down the body than build it up." Regardless of age or sex, walking is the best of all exercises, the biology professor says.—*North-China Daily News*.

Facts About the Peace Proposals

This Journal is very far from joining the herd and accepting the evidence so widely disseminated and so thoughtlessly believed in China and elsewhere to support the charges of treason against Mr. Wang Ching-wei. This Chinese leader, who risked his life many times at the right hand of Dr. Sun Yat-sen when that patriot was striving to build a new China, has been cast from his high position of second in authority in China as President of the Executive Yuan. All the forces of the Chungking regime have been loosed to defame and convict him in the eyes of the Nation. This has been done because he tried to talk peace and stop war in China. The man's whole life record seems to refute the charge against him. In the article presented here the defendant is permitted to speak for himself. Much of what he says already has appeared in print, but often in garbled or distorted form. Chungking would send the man down to history as a traitor. Consistently, he has resisted Moscow's thrusts for power; and, consistently, he has contended for the unimpaired integrity of his country, for the welfare of its people, and for restoration of peace in the land. He may well borrow the words of another great patriot and say to his detractors, "If this be treason, make the most of it."

By *WANG CHING-WEI*

While on his death-bed, lingering between life and death, Dr. Tseng Chung-ming made an earnest if brief remark: "For matters relating to the State, there is Mr. Wang Ching-wei; for matters relating to my family, there is my wife: my mind is at peace." On matters of State Dr. Tseng shared my views, and because we were together most of the time, he lost his life. He died for his country, he died maintaining his views on national policy. While facing death, his mind was at peace, because I am still alive advocating the same policy as himself. Therefore, as long as I have breath of life in me, I will exert all effort to realize our policy—not only for the sake of comforting my friend who will never leave my mind, but, and even more so, for the sake of the Nation whose existence depends on the realization of this policy.

The publication of the telegram which I sent to the Central Government on December 29, 1938, made people regard me as the advocate of peace. It is true that I advocate peace. But am I the only person who advocates peace? No; the fact is that the highest organ of the National Government has, in council, resolved in favor of peace. I am citing the following in support of my statement:—

Minutes of the 54th Meeting of the Standing Committee of the Supreme National Defence Council

Time: December 6, 1937, at 9.00 a.m.

Place: The Central Bank of China, Hankow.

Mr. Wang Ching-wei, Vice-Chairman of the Council, was in the Chair, and the meeting was attended by Messrs. Yu Yu-jen, Chu Cheng, Dr. H. H. Kung, and General Ho Ying-ching, members of the Standing Committee. The following were also present as observers:—Mr. Chen Kuo-fu, Mr. Chen Pu-lai, Mr. Hsu Kan, Mr. Hsu Mo, Mr. Weng Wen-hao, Mr. Shao Li-tze, Mr. Chen Li-fu, and Mr. Hollington K. Tong, Secretary-General: General Chang Chun, Director of the Secretariat: Dr. Tseng Chung-ming.

Mr. Hsu Mo, Vice-Minister of Foreign Affairs, submitted the following report:

Instructed by the German Government Dr. Trautmann, German Ambassador to China, called on Dr. H. H. Kung, President of the Executive Yuan, on November 28, 1937, and on Dr. Wang Chung-hui, Minister for Foreign Affairs, on November 29, 1937. Explaining his mission, Dr. Trautmann said that he had received a dispatch from his home Government stating that the German Ambassador to Tokyo had had conversations with the Japanese Ministers of War and Foreign Affairs with a view to gathering information from the Japanese Government whether she had any desire to liquidate the situation; and on what terms. The Japanese Government put forward several terms and requested the German Government to convey them to the Chinese Government. They were as follows:

(1) Autonomy of Inner Mongolia.

(2) Extension of the Demilitarized Zone in North China. The Central Government will retain her authority over the administration of the whole of North China, but it is hoped that the highest authority appointed to the post will not be from the anti-Japanese element. This applies to existing conditions. In the event of a new Government being set up in North China in the future, her existence should be maintained; but the Japanese Government has no idea of establishing a new Government in North China as yet. The exploitation of minerals that has been under discussion, is to be continued.

(3) The Demilitatrized Zone in Shanghai is to be extended, but the Japanese made no mention as to the extent. The administration of Greater Shanghai will be maintained as before.

(4) The Anti-Japanese question. It is hoped that this can be met by views that had been expressed to Mr. Kawagoe, Japanese Ambassador, by General Chang Chun, then Minister for Foreign Affairs. Details of the plan are matters for the technical experts.

(5) The Anti-Comintern question. Japan hopes that some concrete plan will be adopted with regard to this matter.

(6) Revision of Customs Tariff.

(7) Maintenance and Respect of Foreign interests in China by the Chinese Government.

Terms "Not Too Harsh"

Dr. Trautmann expressed to Dr. Kung and Dr. Wang the hope of interviewing Generalissimo Chiang Kai-shek. An immediate reply was received from General Chiang requesting Dr. Trautmann to see him for an interview. I accompanied Dr. Trautmann to Nanking on November 30, and during the journey in personal talks, Dr. Trautmann expressed the opinion that Chinese resistance against Japan had shown admirable spirit, but that time was ripe for settlement of the dispute. Germany herself had during the Great War, had various favorable opportunities to discuss peace, but was over-confident in her own strength, and thus refused to talk peace until she was forced to accept whatever terms were dictated to her at Versailles. Dr. Trautmann also conveyed Herr Hilter's hope that China would consider the matter, and so far as he could see Japan's terms were not too harsh.

We arrived at Nanking on December 2, 1937. I had an interview with the Generalissimo first. I presented the whole case before the Generalissimo, who remarked that he would discuss the matter with the military commanders in Nanking.

I visited the Generalissimo again at 4 o'clock in the afternoon, Generals Ku Mo-san (Ku Chu-tung), Pai Chien-sheng (Pai Chung-hsi), Tang Meng-hsiao (Tang Sheng-chih), and Hsu Chi-chen (Hsu Yung-chang) were already there. The Generalissimo asked me to report on Dr. Trautmann's mission. After my report they all asked me whether there were any terms other than the above and whether there were any terms limiting China's armaments. My reply was: "According to Dr. Trautmann, there are no other terms than these, and should these terms be accepted hostilities will cease."

The Generalissimo first asked General Tang Sheng-chih for his opinion, but General Tang did not reply at once. The Generalissimo then turned to General Pai Chung-hsi who said: "If these were the terms and nothing else, why should there be war?"

"These are the terms that have been conveyed to us by Dr. Trautmann," I replied.

The Generalissimo then turned to General Hsu Yung-chang who remarked that if these were all, they would be acceptable. General Ku Chu-tung expressed the same view. Then the Generalissimo turned to General Tang Sheng-chih again, who agreed with the others.

Summarizing the matter, the Generalissimo came to the decision that (1) German mediation should not be refused, saying that these terms will not result in the extinction of the nation and (2) that the Chinese authority in North China must be preserved.

Generalissimo Chiang Kai-shek received Dr. Trautmann at 5 o'clock in the afternoon. I attended as interpreter. Dr. Trautmann said the same thing to the Generalissimo that he said to Dr. H. H. Kung and Dr. Wang Chung-hui in Hankow, but added: "Should China not accept now and continue the war, it is feared that the ultimate terms may not be like the present."

Way to Negotiations Opened

The Generalissimo declared that he dared not trust Japan; treaties had already been torn to pieces by Japan and words spoken not kept; but since Germany was a cordial friend to China, and since China was grateful for the good offices of Germany in taking up the mediation, China would take these terms as a basis for discussion. Two points, however, had to be pointed out to the German Government, (1) that Germany had to be the mediator from the beginning to the end; (2) that China's sovereignty and administrative power in North China be permanently preserved. Within these limits, the terms would be taken as basis for discussion. Further, that Japan should not regard herself as victorious and present the terms as an ultimatum.

Dr. Trautmann then asked permission to make one more statement, to which the Generalissimo agreed. He said: "While peace talks are in progress, may I suggest that the Chinese Government adopt a spirit of tolerance?" The Generalissimo replied.

"This is equally applicable to both parties," adding that since peace cannot be discussed as long as the war is in a critical stage, it is hoped that Germany would intimate to Japan the necessity of a truce first.

Dr. Trautmann said that he would convey the two points to the parties concerned, and expressed that in the event of Germany consenting to mediate and Japan agreeing to it, the Reichsfuehrer might make a formal request to both parties for a cessation of hostilities. The Generalissimo replied that if Japan regarded herself as the victor, and told the world that China had accepted all the terms, then negotiations cannot continue.

On our journey back Dr. Trautmann made it clear to me that the conversation was hopeful. When he was in Nanking, Dr. Trautmann assured Generalissimo Chiang that those terms are not an ultimatum.

On board the steamer Dr. Trautmann telegraphed messages to Tokyo and Berlin.

NOTES:

(1) The President of the Supreme National Defence Council is Generalissimo Chiang Kai-shek and the Vice-President Mr. Wang Ching-wei. At that time the seat of the National Government had formally been removed to Chungking, but actually all matters of State were transacted at Hankow. As Generalissimo Chiang Kai-shek had to remain in Nanking directing military operations, the said meeting of the Supreme National Defence Council was presided over by Mr. Wang Ching-wei.

(2) Dr. Wang Chung-hui, the Foreign Minister, was on the standing Committee of the Supreme National Defence Council. But as he was indisposed, Mr. Hsu Mo, the Vice-Minister for Foreign Affairs, took his place. Moreover, Mr. Hsu had just accompanied Dr. Trautmann, the German Ambassador, to Nanking and it was necessary that he should be present to give a report of his activities.

After reading the above verbatim report, one can understand the contents of my letter to the Supreme National Defence Council dated December 28, 1938, in which I said, *inter alia*, "It may be recalled that although the terms proposed by Japan through the intermediary of the German Ambassador, prior to the fall of Nanking, in the early part of December last year (1937), were even more unfavorable and even less definite, yet General Chiang in view of the general situation had no hesitation in accepting them as a basis on which to negotiate an honorable peace."

In addition to the above, I can cite many other instances and give documentary evidence to show that many others, besides myself, are in favor of peace, but the nature of the evidence is such that, in the national interest, it is not advisable to disclose them yet. The case of the German mediation, however, is a closed chapter, and its time value has gone, so there is no objection to cite it as an example.

Some Comparisons

At this juncture, the three queries present themselves. First, in comparing the terms submitted through Dr. Trautmann with Prince Konoye's declaration on December 22, 1938, if the terms submitted by the German Ambassador could be accepted as a basis for peace negotiation, why cannot the terms of the then Japanese Prime Minister be accepted as a basis? Second, when Dr. Trautmann offered his good offices to mediate, Nanking had not yet fallen, and yet the time was considered ripe for peace negotiations. Why cannot peace negotiations be started after Prince Konoye had made his declaration, that is, after the fall of a number of cities—including Nanking, Tsinan, Hsuchow, Kaifeng, Anking, Kiukiang, Canton and Wuhan? Third, at that time the members of the Supreme National Defence Council both in Nanking and in Hankow, were agreeable to peace. Why cannot they be consistent in their views, after Prince Konoye had made his declaration? Why defame those whose views on the question have remained the same? And even go further and attempt to take their lives and so deprive the country of their services?

I do not propose to answer any of those questions. But with regard to War and Peace I cannot refrain from addressing the nation.

Some people may say, "As you have advocated war, you should not also advocate peace." This statement is illogical. What a country aims at is its existence and maintenance as an independent nation. Peace or War is just a means to this end. When war cannot be avoided it must be war. When time comes that Peace is possible then it must be peace. Whether Peace is possible or not, depends on the terms. If the terms violate the national sovereignty and independence then peace is impossible; if the terms are such as not to jeopardize the sovereignty and independence of the nation, then peace is possible. The statement "these terms will not result in the extinction of the nation" is still ringing in my ears. I would therefore ask, why cannot we advocate peace?

Others may say, "China has attained national unity as a result of the war of resistance, and the advocacy of peace will result in the destruction of this unity." I strongly disagree with such a statement. From the dawn of history to the present day, those at the helm of State always made it their duty to maintain domestic peace for the purpose of resisting foreign agression, not to engage in external war for the purpose of maintaining domestic peace. An external war is a very serious matter, so how can we turn an external war into an instrument for achieving internal peace? China is engaged in a war of resistance for the purpose of maintaining her status as an independent nation; she did not go to war only to achieve national unity. I strongly object to using a war of resistance as method of unifying the country. Moreover, as things stand to-day, the advocacy of peace will not affect, in the least, the unity of China, while the non-advocacy of peace may not necessarily prevent a break-up of the united front.

Others may say, "if peace is advocated, the Communists will immediately start trouble." The Communists are, by nature, mischief-makers. If war is advocated, they make trouble just as when peace is advocated. And as a matter of fact, it would be preferable for them to come out in the open and publicly create trouble against peace rather than see them engaged in secret manipulations and intrigue under the cloak of patriotism as is the state of affairs to-day.

Still others may say, "The Powers do not hope that China will make peace with Japan." Whatever the truth of this allegation, I am of opinion that since war or peace affects the very existence of the country and its people, they alone should decide and take the initiative. Diplomacy is merely a means to create a favorable international situation; it does not mean that we have only to do things to the beckoning of others. Moreover, apart from the Third International no country objects to our making peace with Japan.

The above having been made clear, I solemnly declare the following. After the Sino-Japanese War in 1894, a humiliating peace was made, after the Boxer War in 1900, another humiliating peace was signed. It pains me to mention them. I loathe to see a peace of this nature, and hope that the peace we will conclude will not be like what happened in the past.

The Costs of Warfare

France had to endure a humiliating peace as a result of the Franco-Prussian War; she could only come to her own again at the conclusion of the Great War. Germany concluded a humiliating peace in 1919 and had to groan under it until very recently when she regained strength. It may be a pleasant thing to be able to relate such a case of national resurrection, but yet I have no desire to see such a peace, because it is a form of revenge that will go on forever ; it is a peace that cannot last.

What I conscientiously aim at is permanent peace in the Orient. I can say with conviction that China and Japan will be mutually destroyed if they persist in warring with each other ; but they can co-exist and co-prosper if they live in peace with each other. If they studiously work for peace, then an age of stability and tranquility in East Asia is assured. On the other hand, if they are bent on destroying each other, both are doomed to perish. Such is my view of the Sino-Japanese hostilities, which in both countries is shared by many.

During these twenty months of bitter fighting, China has made tremendous sacrifices, but the cost to Japan has also been tremendous. This is clearly a path that leads to mutual destruction. But there is another path lying clearly before us that leads to co-existence and co-prosperity.

There are many enlightened people in China and Japan. Why should they, for the sake of temporary advantages and glory, hesitate to leave the road to mutual destruction and instead take to the road of co-existence and co-prosperity ? I hope that all of us will have the courage of our convictions and work for their realization. Dr. Tseng was the first person to suffer the consequences of his convictions, but his blood is consecrated, and will lead us to, the royal road of mutual salvation.

Lastly, I want to say the following. In the middle of last February, Chungking sent me a passport to go abroad through the good office of a member of the Central Executive Committee. I requested him to convey my verbal reply to Chungking. Firstly, if I had not left Chungking, I could not have sent out my telegram of December 29, 1938. It pained me greatly at that very critical moment to leave the Capital. Even much more painful was it for me to leave the country. But I left the country to show that if my proposals were accepted, personal considerations did not enter the matter. Secondly, I hear that the National Government is trying hard to bring about international mediation. With this, I entirely agree, but mediation and direct negotiation must go hand in hand. Should the Government adopt this policy, my services as a private citizen are at the disposal of the State. Thirdly, should the National Government let the present *impasse* drag on without coming to a definite decision, I may return even though I go abroad now. These remarks must be the cause of the outrage of March 21, 1939. It is a great pity that Dr. Tseng, who is younger than I am, should die before me, leaving behind him cherished ambitions unfulfilled.

I cannot tell whether and when I will share Dr. Tseng's fate. Should I die, I hope my compatriots will re-read these lines, and clearly understand that my policy is the road that will lead China to her salvation, and secure permanent peace in the Orient and in the world generally. Though my suggestions may not be acceptable to Chungking to-day, the time will certainly come when the entire Chinese nation as well as the people of Japan will welcome my proposals, and I will have no regrets.

Refutes Allegations

The allegation, circulated by Reuter on April 5, 1939, that an agreement comprising five terms has been reached between the Japanese Prime Minister and myself should surprise no one, being just an instance of the Chungking propaganda. The source of this rumor was the Chungking *Ta Kung Pao* which, as everybody knows, is owned by a member of the Government, and has for some time past lost its proper function as an independent newspaper.

The allegations are beneath contempt and I had no intention to waste time in denying them, but for the sake of making clear my personal views concerning the present situation in China I feel I am obliged to make a formal statement so as to clarify the position.

When I left Chungking last year and sent out my telegram of December 29 advocating peace, I already anticipated that I would be denounced by the Chungking propagandists as a traitor trying to sell his country, and furthermore, that attempts might be made on my life, either by individuals or by organized bodies. But true patriots who sincerely love the Republic cannot help seeing the necessity for peace. They all have the idea in their minds but they dare not speak out for fear of the consequences to themselves.

Nobody can question my loyalty and love for the Republic founded by the late Dr. Sun Yat-sen. My heart bleeds to see China perish at the hands of ignorant people. It was for this reason that I announced my proposals, disregarding all difficulties and dangers. My only desire is to see that the peace terms will not lead to the extinction of China, and that China may regain her breath and retrace the path to prosperity. These views I will maintain to the last, even if I have to sacrifice my life. Neither threat nor slander will make me falter.

The present war has inflicted the heaviest losses known in history to both China and Japan. Extremely terrible is the plight of the people who were not able to get the protection of the Government. We need not mention those who have lost their lives and properties in the war zones. Even those who have been able to pack up their earthly belongings and take refuge in other places—wandering from the sea-coast to Wuhan, and from Wuhan to Kweichow and Yunnan—will one day have to face Death because of starvation, if the war is allowed to go on. For these sufferings and sacrifices the Governments of both countries must bear the responsibility.

Japan was under the illusion that China would yield without fighting, or even that China would be vanquished by a single battle. China miscalculated and thought that at any time Japan would collapse economically, or that Japan at war would have a revolution. Now that the war has lasted nearly two years, both sides know that China cannot win final victory, that neither Japan can ever hope to conquer and swallow China. Both sides know this well. Yet, the peoples of both countries are made to suffer sacrifices—which are not only unnecessary but also against the moral code of humanity. Should this persist, civilization in East Asia will be doomed and the peoples of both China and Japan will extinguish one another. I am firmly convinced that war means injury to both parties, while peace means the co-existence of both nations. The proposals in my telegram of December 29 were submitted in all good conscience and, I am sure, have carried the approval of the people at large.

Opportunities that Passed

Before the outbreak of the Lukouchiao Incident there were very good opportunities for peace. The only obstacle which prevented peace was that both sides lacked sincerity, and that neither would take up the responsibility. It was not beyond the power of the Japanese Government to suppress the insatiable greed of the Japanese militarists in China. The failure to attain this end can only be ascribed to the lack of sincerity and responsibility. It was not beyond the power of the Chinese Government to properly estimate China's national strength and put forward counter-proposals. The failure to attain this end is also due to the lack of sincerity and responsibility. Still more regrettable, the situation became worse after the Sian *coup d'état*, when the " door " to peace was finally closed. Those who were responsible for the *coup* and those who yielded to the *coup* must take the blame.

My attitude towards communism is known to all, and I will adhere to my policy in order to bring peace to China and Japan, even if I am regarded as an anti-Communist. It is my sincere hope that the Japanese Government authorities will realize the facts of the present situation and carry out negotiations with sincerity so that China's territorial integrity and national sovereignty and independence will be maintained, thus contributing towards the peace in East Asia and the world.

Lastly, I wish to add that since I published my telegram of December 29, 1938, I will base all my future actions for the realization of peace on the contents of that telegram. I loathe to see the loss of any more of our territories as a result of military reverses, which will only bring more sufferings to the people. Even more will I dread should Japan, because of her military gains, change her previously declared attitude and put forward more demands. The intensity of the war at the various fronts has caused me great concern.

It is still fresh in my memory that, soon after the fall of Hankow and Canton, the Chungking military authorities came to the conclusion that the Japanese would attack Sian and Nanning. They knew of this intention. Yet, it was represented as the result of an alleged agreement with the Japanese. Are they anticipating that they would fail to check the invader and tried to shift their responsibility ?

The Way They Do In Shanghai

The great City of Shanghai—so much in the world news, so different from all other great cities of the world, so dirty and impoverished, so vicious and generous, and so bright and gay under its Neon lights, daily creates new problems for the forty-odd nationalities that live in the place. The great polyglot port is like an over-loaded omnibus on a dark uncertain road lumbering along through the night to an unknown destination. John Bull, half owner of the omnibus, is at the wheel in the driver's seat where he has sat grimly from the beginning. The road is getting harder and rougher.

Shanghai, or that major portion of the port which dominates all the rest and is known as the International Settlement, is under the control of about twenty foreign powers represented by Consuls, who compose the Consular Body. The one great power which has no voice in the affairs of the International Settlement, is France, which at the time of concession giving in the middle of the preceding century, elected to play a lone hand and acquired a Concession of her own which she holds and rules as a part of French territory. This French Concession, with an area a little less than four square miles, which is less than half the area of the adjoining International Settlement, immediately adjoins and lies south of the International Settlement. The Concession has its own municipal regime controlled from Paris under a resident French Consul-General.

German residents formerly played an influential part in the affairs of the International Settlement, but Germany lost her extra-territorial rights in China at the time of the world war and in 1919, in fact, all Germans residing in China were herded together and expelled from the country—rather shameless business after the war was over. Germany, therefore, exercises no voice to-day in the affairs of the International Settlement, although her population there and her interests are growing swiftly.

Great Britain has played the rôle of owner, architect, builder and, at length, general administrator of the International Settlement. It is true that it was British energy, brains and money that brought Shanghai to the place of being the world's fifth port. The International Settlement was created and has continued to exist under a form of lease from China known as the Land Regulations. These, like the laws of the Medes, have been unchangeable because any change must have the assent of China. China through the years not only has refused to assent to any change in the Land Regulations that might benefit the foreigner or extend his authority, but on the other hand has struggled to terminate the leasehold and with abolition of extra-territoriality, take back control of all the Shanghai area. The Japanese came late on the scene, at the beginning of the century, but they probably now out number all other aliens in Shanghai. In the course of hostilities they have expelled all Chinese influences adverse to them from the Shanghai area and to-day they are pressing hard on the administration of the International Settlement contending that the Land Regulations are obsolete, unsuited to modern conditions and should be revised in order to bring about a general reorganization of the Municipal Government of the International Settlement. Both Britain and the United States have opposed this and the control and administration of the International Settlement continues to be predominantly British.

Under stress of vastly changed conditions that have been brought about by warfare in China a measure of distinct uncertainty has been brought about in the position of Americans in Shanghai. In a sense their extra-territorial privileges accorded under treaty appear to have been whittled away in the course of recent events and they have found themselves unable to pursue activities that would be proper and legal under their own laws at home. The rights and the status of Americans and of their properties have been brought into question by recent events. It has been made plain that the Constitution does not follow the Flag in this part of the world.

Some fifteen or more years ago an American by the name of Furbush committed a murder in Shanghai and shortly thereafter he found himself facing a capital charge in the United States Court for China. The attorney who defended the slayer emphasized the gravity of the charge, and in view of this, asked the Court to grant a change of venue in the case. The right of a change of venue is commonly accorded in all ordinary American judicial procedure, but Judge C. S. Lobinger, who presided at the Furbush trial in the American Court, promptly denied the attorney's request.

The lawyer then pointed out that the man was charged with a capital offense, which might involve the death penalty. He argued that under the extra-territorial system in China the right of trial by jury is granted by British courts. The right of an American to trial by jury is one of the citizen's most cherished and sacred rights under the Constitution. Nevertheless, Judge Lobingier again ruled without hesitation and refused to permit Furbush to answer the charge before a jury. After the man had been convicted, mercifully, the Court refrained from imposing the death penalty, which it was fully empowered to inflict. Furbush was sentenced to life imprisonment and he still may be serving the sentence for all anyone in Shanghai may know.

All of this is brought up here to give point to developments in a current Shanghai situation and to show that for Americans in China the Constitution does not follow the Flag. The location, nature and functions of the United States Court for China make of it a tribunal different from any other American Court, state or federal, and the uncertainties in this connection are so complex that the status of any American citizen or institution in China is entirely unlike what the status of that person or institution would be in the United States. Neither the citizen nor his institutions in China can stand on what they call their Constitutional rights—or this seems to the layman to be the case.

For example, by joint action of the authorities of the International Settlement and the French Concession an American-owned Chinese language newspaper was recently suppressed and put out of business. This was done for an alleged infraction which probably no American Court anywhere would even entertain for a minute; it was done, in fact, for an action that in the United States would be merely routine professional activity. The Chinese language newspaper is—or was—the *Tah Mei Pao*, a morning offshoot of *The Shanghai Evening Post & Mercury*, Shanghai's well-known American evening newspaper. Both *Tah Mei Pao* and *The Evening Post & Mercury* are wholly American in ownership, editorship and management. The Chinese language paper published what appears by any ordinary journalistic standards to be a completely innocuous speech that had been delivered by Chiang Kai-shek, head of the recognized Chinese Government. Then the lid blew off.

Since this happened a squad of French gendarmes—since the newspaper plant in question is located within the French Concession—has been on guard at the premises, and anything the *Tah Mei Pao* may print must be kept within the premises—or the armed French guards go into action. If even a trivial offense from an American legal standpoint had been committed, it seems likely to this writer that the agile-minded American Editor, Randall Gould, would have devised a dozen expedients by this time to get his paper on the streets. Legally, from every American standpoint, Editor and Owner of the newspaper both are in the right, but this is Shanghai, and Americans seemingly have to learn that Constitutional rights slip a cog in this land now and then, and there's nothing to do about it.

In this case if the newspaper sought redress in litigation it would probably turn first to its own tribunal, the United States Court for China, but the United States Court for China can exercise no jurisdiction over either the British Police officials of the International Settlement with whom the action originated, or with the French police, who carried out the action in co-operation with the Settlement authorities. If the newspaper sought redress against the British police authorities of the International Settlement in the British Courts it would be brought up against special British legislation in the form of what is called an Order in Council which has the effect of bringing the action that was taken against the *Tah Mei Pao* within British law. The *Tah Mei Pao* might try its luck in the Court of Consuls composed of consular officials of the various foreign powers, but the Court of Consuls would never accept any purely American viewpoint. It would see the Municipal Council as a creature organization under jurisdiction of the Consular Body and action of Municipal Council officials would have its support. In the emergency the Editor and Publisher of the penalized American newspaper sent a very long and very expensive cablegram to Mr. Cordell Hull, Secretary of State at Washington, but Mr. Hull is a very, very busy man and Shanghai is far away.

It might give Shanghai a smile if *The Shanghai Evening Post & Mercury* and its *Tah Mei Pao,* which have consistently and vigorously resisted Japanese encroachments and criticized Japanese activities in general, facing their own particular dilemma at this time, should be brought to see some virtue in the Japanese contention that the whole administrative set-up of the International Settlement is obsolete, unsuited to modern times, and should be revised and reformed. This contention, at any rate from the American standpoint, possesses the virtue of being logical.

Another of Shanghai's current pains in the neck is concerned simply with the flying of flags, and this involves both the International Settlement and the French Concession.

In compliance with repeated demands of the Japanese authorities in Shanghai that the hoisting of the Chinese nationalist flag be prohibited, the French Municipal Council seized a number of the flags on April 19, when the Chinese were observing " national spiritual mobilization " week under orders from Chungking.

The seizure caused a furore among the Chinese, and consequently an agreement was concluded on May 2 between the French authorities and the Chinese Ratepayers' Association of the French Concession, under which Chinese were permitted to hoist their national colors on eight national holidays of the year.

The authorities of the International Settlement followed this example and approved the eight holidays. However the Japanese were not satisfied with this agreement, demanding a complete ban on the nationalist flag. The Japanese logic is that the National Government has ceased to exist in this part of China and been superseded by the Reformed Government, and hence the display of the national flag, a symbol of authority of a government hostile to Japan and the Reformed Government, should be regarded as an anti-Japanese act of a political nature, such as the foreign authorities have agreed to suppress.

On May 11 the authorities of the French Concession and the International Settlement issued a joint Proclamation placing a ban on activities of a political nature, threatening any person participating in such activities with expulsion, indicating that drastic curfew regulations may be imposed, if deemed necessary, and promising severe punishment to any person committing acts prejudicial to the preservation of peace, order and good government.

In the meantime, Japanese wishes for reforms in the International Settlement of Shanghai were officially conveyed to Sir Robert Craigie, British Ambassador, and Mr. Jospeh C. Grew, American Ambassador, by Mr. Renzo Sawada, Vice-Minister for Foreign Affairs, in Tokyo on the afternoon of May 3. One of the reforms is a revision of the Land Regulations in force and remaining virtually as drafted in 1866.

As a close sequel to Mr. Sawada's action, came representations of Mr. Yoshiaki Miura, Japanese Consul-General at Shanghai submitted on May 4 to the British and American Consuls-General and the Chairman of the Municipal Council. Mr. Miura also demanded a revision of the Land Regulations and a practical reform in the Special District Court, where judges, appointed by the Chungking Government, pass sentence upon anti-Japanese elements. Both the British and American Consuls-General are understood to have promised Mr. Miura to communicate with their respective home governments on the matter, while the Chairman of the Municipal Council is reported to have pointed out that the questions would have to be decided by the Consular Body.

The United States Government sent a note to Tokyo on May 17 in reply to the representations of Mr. Sawada. The note refused to grant Japan's demand for a reform in the International Settlement on the ground that conditions in Shanghai " are so far from normal at present that there is totally lacking any basis for a discussion looking towards an orderly settlement of the complicated problems involved which would be reasonably fair to all concerned."

Another question pending between the Japanese and the Municipal authorities is the censorship of news. The Commissioner of the Shanghai Municipal Police partly acceded to Japanese wishes on May 5, when he sent identical letters to the editors of the vernacular newspapers in the Settlement.

All news, irrespective of the source from which it is obtained, " any speech or manifesto emanating from any source having reference to the present hostilities, political campaigns, or political associations, or containing any exhortations to violence," the letter stated in part, " must be referred to the Special Branch, Police Headquarters, for examination before release for publication."

Foreign publishers of Chinese-language newspapers met on the morning or May 10 in the Council building at the request of Mr. C. S. Franklin, Chairman of the Municipal Council, to hear the views of the Council regarding articles of the above-mentioned character. It is reported that the conference was held in a friendly manner and those attending expressed their willingness to cooperate with the Council.

On May 18, the Council demonstrated its attitude about control of the Press and cancelled two American-owned Chinese-language newspapers. The reason for cancellation is that the report of a speech of Generalissimo Chiang Kai-shek containing certain expressions, the use of which at the present time is considered to be contrary to the interests of the preservation of law and order in the International Settlement.

At the same time the British Consular authorities took action under the Order in Council, Newspaper Regulations of 1938, and ordered two Chinese-language newspapers owned by British subjects to be suppressed.

Britain's China Refugee Expenditure

It was disclosed in Commons recently in a Havas dispatch that a total of £8,000 had been devoted to the evacuation and housing of British refugees from China upon the outbreak of hostilities in 1937. Mr. R. A. Butler, Parliamentary Foreign Affairs Under-Secretary, announced in the House of Commons during the debate upon the Foreign Office Credits Bill.

The project was eventually adopted by a vote of raised hands after a Laborite amendment had been defeated by 207 to 121. The Bill provides £259,087 for Foreign Office works.

With regard to the expenditure of £8,000 upon the evacuation of British nationals in China, Mr. Butler specified that arrangements had been made by the Navy and Consular authorities with local committees.

Between August 17 and 24, 3,800 British subjects had been sent to Hongkong in six ships, while about 3,300 others looked after and paid for themselves, he added.

In moving the Bill providing credits for the coming fiscal year Mr. Butler referred to the large sum paid Reuters news agency during the September Czech crisis last year for broadcasts made from Leafield Station to Europe and the Far East and from Rugby Station to the world.

He stated the value " of this decision will be appreciated when it is understood that some 20,000 words were going out daily from some American news agencies."

During the debate, Mr. D. R. Grenfell, Laborite of Gower, Glamorgan, moved an amendment symbolically reducing the Foreign Office credits by £100.

He criticized the Government's foreign policy and demanded an investigation of the activities of Sir Robert Hodgson, British Agent in Burgos prior to London's recognition of the Nationalist Spanish Government. He also voiced his disapproval of the dispatch of Viscount Runciman to Prague during the September crisis of 1938.

Conservative Charles Williams of Torquay, Devon, congratulated the Foreign Office upon work done in evacuating British citizens from the war areas of China in August, 1937.

" A great number of our own people who lived in China," he stated, " had considerable trouble in many ways and incurred great danger. . . .

" We have heard so much about other people and foreigners that I do not think there is any great harm in an Englishman saying that the government's relief money is spent gladly and in congratulating the Foreign Office on the work they have done in China."

In Memory of Dr. Tseng Chung-ming

By WANG CHING-WEI

That I should be called upon to write the obituary of Dr. Tseng Chung-ming (often rendered as *Tsen Tson-ming*) is quite beyond my expectation, for it is still vividly in my mind that, when I was lying in a pool of blood after the attempt on my life at the Central Kuomintang Headquarters on November 1, 1935, Dr. Tseng Chung-ming came to see me in great anxiety and sorrow. I thanked him for his sympathy and expressed words to comfort and reassure him. How could I ever have dreamt that we should change places, that it should now be Dr. Tseng who, in a pool of blood, tried to comfort and reassure me! Death had cast its eyes on me then, but I am still alive. Dr. Tseng, however, is gone forever.

The country has come to a most critical phase in its history. In trying to save the country, the dead have done their part, so it is up to the living to continue the work unto death, unconcerned to whether their efforts end in failure or be crowned with success; the great work of those who have departed will forever be in our memory.

Born in 1896, on the 28th of the Second Moon, Dr. Tseng was a native of Minhsien in Fukien. His father died when he was a small boy. His mother was a most lovable and capable woman. His elder sister, Mrs. Fang *née* Tseng Hsing, is a noted woman educationist, whose husband died young and who after her husband's death went to Japan to continue her studies, accompanied by her little son Hsien-shu, her sister-in-law Chun-ying, and her brothers-in-law Fang Shing-tao and Fang Shing-tung. One by one they joined the Tungmenghui, and became followers of Dr. Sun Yat-sen in the revolutionary cause.

In 1910, Tseng Hsing participated in my plot to assassinate the Prince Regent in Peking. Other participants were Miss Fang Chun-ying, Li Chung-shih, Yü Yün-chi, Huang Fu-sheng, and Miss Chen Pi-chun. The *coup* failed. Huang and I were arrested. The others made good their escape. Tseng Hsing and Chun-ying also took part in the famous *coup d'état* in Canton on the 29th of the Third Moon in 1911; in this *coup* Yü Yün-chi and Fang Shing-tung fell on the field of honor.

After the establishment of the Republic of China in 1912, Tseng Hsing, Chun-ying and Pi-chun were awarded Government scholarships to study in France; they took Chung-ming who was then a boy of fifteen and Chun-pi, Chung-ying's sister, then thirteen years of age. Their means of livelihood were limited, and what the three received from the Government had to be shared by all.

From his elder sister Chung-ming learnt of his duties to the country. At the Lycée Montargis, he soon won a reputation as a brilliant and diligent scholar. Since he left China when still very young, he had very little chance of studying Chinese, his mother tongue, and so devoted all his spare time to the study of the Chinese language and literature. His accomplishments in both Chinese and French languages were remarkable. His devotion to work, his tolerance, his self-restraint, his resolute determination, so apparent to all who know his subsequent services to the country and the nation, all took shape at this time.

I myself had always had the fervent desire to study abroad, but due to the unsettled conditions of the country ever since 1912, it had always been impossible for me to stand aloof from the affairs of State and so I never had a chance to realize my ambitions. Dr. Tseng, however, was more resolute. After graduating at the University of Bordeaux with the degree of Bachelor of Science in Chemistry, he proceeded to the University of Lyon where he was awarded a doctorate in Literature. Later, he was appointed Chief Secretary of the Institute Franco-Chinoise at the University of Lyon, and did a great deal to promote Sino-French cultural relations. It was at this time that he took keen interest in political affairs at home. It was at this time too that his political ideas took definite shape.

Dr. Tseng and Madame Tseng (*née* Fang Tchun-pi) were schoolmates from their childhood. They were among the happiest of couples. Madame Tseng is a well-known painter of international reputation. They returned to China in 1925, when both of them were appointed professors at the National Sun Yat-sen University of Canton. Upon the proclamation of the National Government in Canton on July 1, 1925, Dr. Tseng was appointed a Secretary of the Government. Thus he started his active political career.

The ensuing years saw China in a mixed state of turmoil and progress. Dr. Tseng and I were constantly together. Struggling together, his judgment quickly ripened and he acquired a firm grasp of affairs. He was elected an associate-member of the Central Executive Committee at the Fourth National Congress of the Kuomintang in December 1931. On January 28, 1932, he was appointed Secretary-General of the Executive Yuan; he was later transferred to the Ministry of Railways as Vice-Minister.

China was then facing a national crisis on account of the invasion of Manchuria, and hostilities at Shanghai were at their height. The one and only desire of the nation was to find a way out for the salvation of China. The Chinese Communists, however, took advantage of the situation and started an offensive in Kiangsi with the object of overthrowing the Republic of China. The Central Government took decisive action and adopted the policy, internally, to uphold the Three Peoples' Principles as the basis of national reconstruction in order to develop and consolidate the national strength, improve the livelihood of the people and strengthen the national defence, while externally, to maintain peace and justice in order to win over international sympathy and assistance, and make Japan realise her mistakes with regard to China. This was a farsighted, immediately practicable policy, aiming at the fundamental solution of China's problems and the salvation of the nation as an independent Sovereign State.

The whole nation worked solidly behind this policy. The Chairman of the Military Affairs Commission, General Chiang Kai-shek, undertook the task of suppressing the Communist-banditry, with his headquarters in Nanchang. Other governmental departments did their share of work, all with the same aim in view.

As Vice-Minister of Railways, Dr. Tseng assisted Mr. Ku Meng-yu, the Minister of Railways, in the planning and execution of many of his schemes to improve China's railway system. There has been a remarkable improvement in railway administration despite financial difficulties and the heavy burden of railway indebtedness, both foreign and domestic. The building of the railway ferry between Nanking and Pukow, the extension of the Lunghai Railway are commendable achievements. But the completion of the Canton-Hankow Railway during their tenure of office inaugurated a new era in the history of Chinese railways. It has been over a quarter of century since the first plans were made for the line connecting two of the most important cities of China. The vital importance of this railway in China's national defence scheme cannot be disputed, while its potential value in the economic life of the Chinese people is equally significant.

At the Fifth National Congress of the Kuomintang, in November 1935, Dr. Tseng was re-elected an associate-member of the Central Executive Committee. Shortly afterwards he resigned his Vice-Ministership of Railways. In February 1936, he accompanied me to Europe. On learning of the Sian *coup d'état*, in December 1936, we returned to China. In February 1937, he took up the post of Deputy Secretary-General of the Central Political Council. In view of the war of resistance against Japanese aggression, the Central Political Council decided on the organization of the Supreme National Defence Council and Dr. Tseng was appointed Director of the Secretariat of the Council.

The policy decided on by the Central Government has been to mobilize the strength of the whole nation for their purpose of resisting Japanese aggression; and with regard to the question of peace, not to close the door of negotiation—resistance and peace not being contradictory. Even at the time of the Lukouchiao Incident on July 7, 1937, the Central Government made it clear to the whole world that China wanted peace and would welcome mediation by a Third Power. When the war spread to Shanghai and Woosung, the Chinese were ready to accept the proposal for mediation of the Brussels Conference. On the eve of the fall of Nanking, Dr. Trautmann, the German Ambassador, conveyed, upon instruction of his Government, the Japanese peace terms to the

Chinese Government and the Central Government accepted them as a basis for negotiations.

Upon the convocation of the League of Nations in September, 1938, the Central Government, again, instructed the Chinese delegates to the Assembly to invoke Article 17 of the Covenant, providing for the peaceful settlement of the dispute. All these were too well known to the world, and Dr. Tseng, in view of his position in the Government, was fully aware of them.

The fate of a nation hangs on the question of war and peace. When there is no alternative but to fight, she must go to war. When there is prospect of peace, then she must choose peace. This is the way of the responsible statesman and patriot, and especially true in the case of China. The war front has extended to nine provinces. Over a million of the fighting forces have died and been wounded on the battle field. An untold number of civilians have also lost their lives. Therefore, should the terms of peace be such as not to prejudice the maintenance of the sovereign and independent State, the honest statesman and patriot must seize at the opportunity to restore peace, in order that the nation may gain breath to recuperate and rehabilitate.

The communists, however, owe no loyalty to their mother country and are loathe to see the re-establishment of peace. They utilized the Shanghai Hostilities of 1932 to strengthen their position in Kiangsi. When the Central Government embarked on the extensive campaign for the suppression of the communist-bandits, as a result of which they had to migrate to the North-west and were on the verge of annihilation, they engineered Sian *coup* and utilized the Sino-Japanese situation to disguise their real objects and deceive the general public. With the outbreak of the present Sino-Japanese War, they took further advantage of the situation; increasing their influence and intensifying their activities, both politically and militarily; all the time intriguing for the overthrow of the National Government. Peace, therefore, would be fatal to their aspirations, hence their bitter opposition to, and unscrupulous propaganda and intrigue against, any kind of peace effort.

Aware of the critical situation in which the nation has found herself as a result of the hindrances to the proper execution of national policy and the possible usurpation of control by the unscrupulous elements which could only lead to the extinction of China altogether, I have, repeatedly, protested my anxieties and fears to the Supreme National Defence Council. On December 9, 1938, General Chiang Kai-shek came to Chungking; I availed myself of the opportunity to convince him of the seriousness of the situation, but unfortunately I failed in my efforts and had therefore no alternative but to leave Chungking. I left on December 18, 1938, and arrived at Hanoi the next day, accompanied by Dr. Tseng.

My peace proposal to the Central Government was released on December 29, 1938. On March 21, 1939, about 2 o'clock in the morning several assassins broke into my residence at Hanoi, firing dozens of shots. Dr. Tseng and four others were injured. Dr. Tseng was critically wounded and succumbed at about 4 o'clock in the afternoon, Madame Tseng, in trying to protect her husband, received three shots herself; the other three were injured in various degrees. Three of the assassins were arrested on the spot. The next day, French papers in Hanoi were unanimous in ascribing the act to the Chinese Blue Shirts and reported that the assassins had confessed that they were actually aiming at my life. Though legal proceedings are yet to take place, the facts as hitherto revealed sufficiently indicate to us the motives behind the crime.

Dr. Tseng had a keen literary taste. He was the author of several books on literature. In the political field, he preferred action to speech, also because he occupied a unique position in the Government which demanded the strictest secrecy. Always performing his duties with the utmost possible care, he had a clear view of the background and inner workings of the Central Government and of its policies. His sole wish was to work for the salvation of the nation especially when it was not too late; his life was only a secondary question.

From the time he was wounded until he passed away, he was in a conscious state. He told his relatives and friends: "For matters relating to the State, there is Mr. Wang Ching-wei; for matters relating to my family, there is my wife; my mind is at peace." Madame Tseng in her agony said, "Death might occur at the war front; death might occur in consequence of advocating peace; we have to exchange our own death for the existence of the nation."

Dr. Tseng is survived by his wife and three sons. All his sons are still young. The families of Fang and Tseng have rendered great services to the revolutionary cause ever since the end of the Ching Dynasty up to this day. Some have sacrificed their lives, others are still struggling on. As I have been in constant contact with Dr. Tseng both personally and officially for years, I can only record his death as a sad loss to his family as well as to the nation.

AMERICANS AGAINST WAR

The *International News Service* reported from Washington, D.C. on May 12, that tremendous floods of anti-war mail demanding sternly that Congress keep the United States out of war have been pouring into the capital. More than 1,000,000 such letters have been received during the past two months, the Senate military affairs committee revealed to-day in giving final approval to the drastic bill to draft the wealth of citizens in the event of war.

Meanwhile, the forces demanding an amendment to the Constitution compelling a referendum on American entrance into a foreign war continued to bombard the Senate judiciary committee, and the skirmishing behind the scenes with regard to revision of the neutrality legislation showed growing support for the amended plan submitted by Senator Guy M. Gillette, Iowa Democrat, which would allow shipments of any goods desired by belligerents but authorize the President to designate war zones which Americans would enter at their own risk.

Since Chancellor Adolf Hitler's recent coup in Czechoslovakia and the restoration of Memel to Germany, there has been a rise in sentiment throughout the United States for boycotting goods made in Germany, according to a survey by the American Institute of Public Opinion, headed by Dr. George Gallup, the results of which were made public a few weeks ago.

Just after the Munich conference last autumn, institute studies found a small majority of voters in favor of a Nazi boycott, and this sentiment increased after the German anti-Jewish drive in November. The trend continued upward through the Nazi occupation of Prague and Memel until the most recent institute survey finds that 65 voters in every 100 say they would join a movement to stop buying German-made goods, Dr. Gallup reported.

The growing disapproval of Germany's policies is also reflected in the results of a companion survey on tariffs, he added. Three days after Chancellor Hitler marched into Prague, the American State Department raised the duty on German-made goods brought into the United States. This action, according to the institute, is approved by an overwhelming majority of American voters—more than seven in every ten.

The boycott issue, put to voters throughout the country by the institute at regular intervals during six months, was as follows: "Would you join a movement in this country to stop buying German-made goods?"

	Yes	*No*
	%	%
October, 1938	56	44
December, 1938	61	39
April, 1939	65	35

A second question in the latest survey asked:

"Our Government is showing its disapproval of Germany's policies by putting a special tax on German-made goods brought into the United States. Are you in favor of this special tax?"

	%
Yes	78
No	22

The survey found no important differences of opinion on the boycott issue by ages, by political parties or by geographical sections. Throughout all areas of the country, sentiment for a boycott movement runs to 60 per cent or more, Dr. Gallup said. Some difference of opinion by economic groups was noted, however, the lower-income voters being more in favor of using the boycott as a weapon of protest than the upper-income voters.

The Revised Five-Year Plan of Manchoukuo

With the Great War as its turning point, the world situation has undergone a drastic change. Despite the continual cry for universal peace, the present era has been marked by new orientations in the policies of the nations; some have gone nationalist, others communist, still others totalitarian. In the field of economics, the "economic liberalism," which had long held sway since the days of Adam Smith, has been superseded by policies of stringent protectionism and control, culminating in the frantic efforts of the nations to keep their resources and markets exclusively to themselves. The principle of Free Trade has thus become entirely a thing of the past.

In other words, the nations of the world, whether they like it or not, have been compelled to form so-called economic blocs, which divide the world into a few strictly secluded camps, and this tendency, added to the racial, political and ideological frictions constantly arising among the nations, has brought about an extremely acute international situation. Thus, even the faintest hope of establishing permanent peace appears dim and the trend of would politics is such that one world think that the Powers had actually commenced preparing for war.

As an inevitable sequel to such an unhappy development, there has been a growing tendency among the leading nations of the world to secure self-sufficiency within their respective blocs in collaboration with their close allies, and for that purpose, to resort to various policies of planned economy, such as the exercise of state authority in controlling domestic industries or the enforcement of various exclusive measures for their protection and development.

The Five-Year Industrial Development Plan of Manchoukuo, launched with much hope and confidence with the year of Kangte (1937) as its initial year, is nothing but an embodiment of her general policy to accommodate herself to these changing circumstances.

Development of Manchoukuo and Her Second-Period Economic Construction

The brief span of six years immediately following the establishment of Manchoukuo might very well be designated first-stage construction, which was beset with innumerable difficulties and handicaps inevitably attendant upon a new State. Thanks to the earnest efforts of both her Government and people, however, and to the whole-hearted assistance of Japan, her ally, Manchoukuo successfully surmounted these obstacles, and was able to complete all the fundamental works essential for the achievement of her future development.

Manchoukuo's achievements during these several years were indeed noteworthy. Her finance has been placed on a sound and substantial basis, the maintenance of her public order has been firmly established, currencies have been unified and adjusted with very conspicuous results, railways and other communications facilities have been brought under a centralized management and witnessed a really remarkable development. As for the administrative structure, which constitutes the very impellant force for the functioning of all administrative organs of the State, complete and thorough adjustments and renovations were effectively carried out. In short, it may be said with ample justification that it was precisely during this brief period of her first-stage construction that Manchoukuo had her national basis unshakeably consolidated, and her political and economic organizations as a modern State brought practically to perfection. The fact that she has recently made her formal debut in world politics by entering into normal and friendly relations with such rising Powers as Germany, Italy and Nationalist Spain, not to mention the Vatican City, the Dominican Republic, El Salvador, Poland, etc., which have accorded her *de jure* or *de facto* recognition, attest to the remarkable advancement achieved during this initial period.

From the purely economic and industrial point of view, however, it must be observed that the period of Manchoukuo's first-stage construction was devoted chiefly to the institution of basic research and investigations, as well as the establishment and reorganization of her fundamental systems and institutions.

Immediately following the establishment of the State, the Government of Manchoukuo announced the following principles as the basic policies for her economic construction:

(1) The interests of the people as a whole will be made the key-note and efforts will be made to prevent any exclusive class of people from monopolizing the benefits of the exploitation of natural resources and the development of industries, and to enable all to enjoy such benefits;

(2) In order to develop all natural resources most effectively and to secure co-ordinated development of every branch of economy, national control will be exerted on important economic activities, and measures for their rationalization devised;

(3) Capital investments from various parts of the world will be welcomed, while appropriate and effectual use will be made of the technical skill and experience and other essentials of civilization, taken from advanced nations;

(4) With a view to harmonizing and rationalizing economic relations among East Asiatic countries, and in view of the close economic interdependence between Manchoukuo and Japan, emphasis will be placed upon securing co-operation between the two nations, and thereby rendering more intimate the relationship of mutual assistance.

In pursuance of these policies, the Government, at an early date, established a principle that any basic economic or industrial enterprise having a vital bearing upon national defence or the development of the country should be conducted either by the State or by special corporations in accordance with the principle of "one enterprise for one corporation," and has since used its utmost care lest such enterprise should be carried on for the purpose of sheer commercialism, but that it may be operated strictly along the lines of national policy so as to conform to the interests and welfare of the nation as a whole.

Moreover, the Government lost no time in instituting extensive and thorough research and investigation as regards the potentialities of the country in respect of natural resources and the possibilities of the economic and industrial development of the nation. Soon after the founding of the State, for example, the Government established for that purpose an official organ, then styled the "Provisional Bureau of Industrial Research," which, beginning with the investigation of the actual conditions of the agrarian villages on an unprecedentedly extensive scale, assiduously carried out systematic research of all matters of economic importance, such as mineral and hydro-electric resources, the possibilities of factory founding, agricultural, livestock, forestry and fishery resources, as well as land improvement. At the same time, the Government devoted its untiring efforts to the perfection of other facilities for conducting research and experimentation. In a word, no pains were spared by the Government in the acquisition and preparation of basic materials and data required for the building up of the economic and industrial structure for a modern and progressive State.

Having thus prepared herself for the next stage of her economic development, Manchoukuo, on greeting the 4th year of Kangte (1937) the sixth year since her birth, boldly embarked upon the so-called "Second-Period Economic Construction" with the firm resolve of accomplishing rapid and effective enhancement of her national power by forging ahead with an all-round development of her industries through the concerted efforts of the whole nation. The Five-Year Industrial Development Plan is in fact the very framework on the basis of which this "Second-Period Economic Construction" is to be carried out.

New Development in International Situation Affecting Manchoukuo

The basic policy for the industrial development of Manchoukuo may be self-evident from the ideals for which the State was established. Its chief aim is to develop her rich natural resources with a view to strengthening her defences as well as promoting the welfare of her people.

It may be recalled that at the time when the Five-Year Industrial Development Plan was first formulated, the international situation confronting Manchoukuo was such that it urgently called for a further intensification of her semi-wartime organization, and for this reason, it was scheduled in the plan to increase the output of necessary commodities and materials to such an extent as would enable her to cope adequately with the situation. In the course of the first year of the plan, however, the international situation surrounding Manchoukuo again underwent a great change owing to the sudden outbreak of the China Incident, forcing her to shift now from her semi-wartime organization to a real wartime footing and, with the development of the incident, to re-consider seriously her economic relations with North and Central China.

Thus the Five-Year Industrial Development Plan of Manchoukuo had to be modified before entering upon its second year in order to be adapted to the changed circumstances, and it is solely for this reason that the plan has been subjected to a re-examination, and consequently, to a number of revisions on more positive lines, such as, for instance, the enlargement of the scale of the plan and the advancing of the dates for the completion of some of the undertakings.

Creation of a New Structure for Development of Heavy Industry

The fact that one of the main aims of the Five-Year Industrial Development Plan of Manchoukuo consists in the amplification of the nation's productive capacities with a view to strengthening her defence facilities, automatically places the main emphasis of the plan upon heavy industries, and it is also quite natural that, with the shifting of the State from a semi to a real wartime footing, this importance should become all the greater.

Accordingly, the recent modifications, to which the plan has been subjected, are predominantly aimed at the realization of a speedy development of the nation's industrial capacities with heavy industries as the nucleus. Needless to say, effective development of heavy industries can be achieved only through close collaboration among the co-related industries, and in this connection, it may be noted that the so-called "Special Corporation System," which Manchoukuo adopted immediately after her formation as one of the basic measures for her economic construction, has proved highly efficient. The actual results obtained by such corporations during the first year of the Five-Year Industrial Development Plan amply testify to this fact, and even brighter achievements are now ensured for the future.

Special mention must also be made of the Manchuria Heavy Industry Development Company, which was organized in December, 1937, as an organ to expedite the effective execution of the industrial policy of the State.

Briefly, the object of this company is to insure the most rationalized management of each co-related enterprise by co-ordinating the activities of the special corporations, which had been separately engaged in heavy industries, and also to direct and aid these corporations in developing in a most efficient manner each enterprise assigned to them. It is thus most confidently expected that, by the proper functioning of this company, all special corporations will be able to achieve better results than ever and the materialization of the Five-Year Industrial Development Plan greatly accelerated.

Survey of Actual Results in Initial Year

As may be seen from the foregoing, the Five-Year Industrial Development Plan of Manchoukuo is really epochal and the most gigantic task that has ever been undertaken since her birth. Naturally, no small amount of difficulty had been foreseen in its path, and it is highly gratifying to note that, in spite of such discouraging outlook, the plan was finally put into practice through the hearty co-operation between the Government and the people.

A brief survey of the actual results achieved under it during the initial year of its execution follows.

Owing, firstly, to the inadequacy of some of the basic requirements and data essential for formulating necessary programs, and, secondly, to the sudden outbreak of the China Incident, which brought in its train numerous inconveniences and handicaps, such as the difficulty of acquiring raw materials and tools, the scarcity of technique and labor and an excessive strain upon the railway and other transportation facilities, etc., it is true that the plan was obstructed in no small way. The plan, however, was pushed ahead as originally scheduled in defiance of these handicaps, and highly gratifying results as are summarized below have been recorded :

Mining and Industries

In these departments, steel, electric power, aluminium and soda ash each scored greater progress than had been originally scheduled, and coal, lead, zinc, salt, pulp and vehicles came respectively up to their prearranged programs, while liquid fuel, gold and asbestos fell but slightly short of the prescribed mark. As regards magnesium, motor-cars, aeroplanes and preserved meat, all necessary research and preparations for the materialization of the contemplated projects were steadily carried out.

Agricultural Produce

In spite of the various adverse factors such as the insufficient distribution of certain kinds of seeds, the crude state of the farming technique and the visitation of floods in South Manchuria and other districts, the general conditions of sowing and planting showed even better results than had been originally estimated, with the result that the actual yield of most of the crops reached their estimated figures.

Stock-Farming

As regards the improvement and multiplication of domestic animals, all the basic undertakings, such as perfection of breeding and improving farms, the training and appointment of technical experts, and the prevention and extermination of cattle diseases, witnessed very satisfactory results as previously arranged. The actual results of the improved cross breeding of sheep and horses are at present difficult to ascertain, and it appears that there is still something left to be desired in this branch of stock-farming.

As for the multiplication of sheep, horses, cattle and pigs of old breed, it is presumed that results very close to the original estimates were obtained, while the output of live stock made a record by no means short of the prescribed level.

Transportation and Communications

The construction of railways, the construction and improvement of State highways, harbor improvement at Rashin and Hulutao and the perfection of other communication facilities having all scored very satisfactory progress according to the original program, this department led others in achievements of the first year of the plan.

Financing Enterprises, First Year of Plan

The total of funds required for accomplishing the enterprises scheduled for the initial year of the development plan was orginally estimated at MY430,000,000, but owing to the postponement of the dates for commencement of some of the undertakings, and for other causes, the amount actually raised represented about 80 per cent of the original estimate, showing at the same time that the plan operated very satisfactorily.

Industrial Development and Its Revised Points

As already mentioned, Manchoukuo's Five-Year Industrial Development Plan is a step to second-stage economic construction and is based on the demands arising from the present wartime organization.

Accordingly, it stands to reason that exploitation of the national resources of Manchoukuo is extremely urgent. The substance of the Industrial Development Plan, born of the above-mentioned necessity, embodies the following :

(1) Plan speedily to establish basic industries or industries relating to national defence, such as iron and steel, coal, liquid fuel, the power industry etc. ;
(2) Plan to manufacture motor-cars, aeroplanes, arms, trucks, etc., which are capable of fulfilling the requirements of the continent ; and
(3) Plan to increase the output of general agricultural products, to ensure the resources required by both Japan and Manchoukuo, and in general to be able to supply the needs of the continent.

The revised development plan was drawn up by studying the results of the various investigations in the past, by considering the actual results of the first year and by maintaining close contacts with the persons in charge of each enterprise.

Mining and Manufacturing Industries

That the key note of the Industrial Development Plan lies in the rapid development of mining and manufacturing industries, especially in heavy industries, requires no further emphasis. A general outline of the plan on each of the resources will be given here.

This country was known from olden times for her abundant iron resources, but it was generally thought that the iron ore was of poor grade. Naturally in the development of iron-mining in this country, efforts were mainly devoted to develop and work these low grade deposits such as those near Anshan and Penhsihu. After the founding of our Empire and with the restoration of public peace and order, it became clear gradually that iron deposits of better quality existed in the vicinity of Anshan, Tunpientao, a district near the Manchurian-Korean boundary, and several other places as a result of successive investigations, and this fact shed a new ray of hope on the future of Manchoukuo's iron and steel industries.

With the aim of increasing production efficiency four-fold, the Government carried out a plan to expand Anshan and Penhsihu mines and to exploit those in the Tungpientao area. This plan for increased production of iron, under the pressure of the world-wide iron famine in its initial stage of the first year, of necessity forced the enlargement of the original development plan. The Government, on the other hand, planned to produce luppe, a substitute metal for pig iron, and started on this scheme. Investigation and mining in Tungpientao have made better progress than at first expected. The Government expects to realize the production of 5,000,000 tons of pig iron, 3,500,000 tons of steel ingots and 2,000,000 tons of steel annually. With the establishment of the motor-car and aeroplane industries, an increase of specific iron and steel products is also being planned.

In view of the importance of iron exploitation and of the sudden rise in the iron market since last year, the Government has decided to control distribution. Again, in the spring of this year, the Government enforced the Law for Controlling Iron and Steel to execute smooth control of distribution and production.

Coal Resources

Coal is found abundantly in this country. Successive investigations revealed that deposits are enormous, being roughly estimated at from 15,000,000,000 to 30,000,000,000 tons. The whole country is liberally dotted with sections rich in coal. Rich and excellent coalfields such as those in Fushun, Fushin, Peipiao, Tunghua, Penhsihu, Sulun, Mishan, Houkan, Sanshin, Jalainor, etc., were discovered and exploited one after another. In the initial plan, the Government expected to increase former production twofold mainly exploiting the new coalfields. In the revised plan, the Government expects to obtain between 38,000,000 and 40,000,000 tons a year corresponding to increased production in iron and steel. Development of these mines chiefly depends on the extension of the work of the Manchuria Coal Mining Company, a special company established for the purpose of operating under one management all coalfields in Manchuria other than those operated by the South Manchuria Railway Company.

Japan at present is ready to import as large a quantity of coal as possible, unlike the former days when the importation of Manchurian coal was strictly regulated.

Liquid Fuel

It is said "one drop of petroleum is worth the same quantity of blood." Petroleum, like iron, is extremely important for national defence. But neither Japan nor Manchoukuo is blessed with petroleum resources. The security of its supply is an urgent necessity at the moment. To meet this need, the development of substitute fuels by coal liquefaction, dry distillation of shale oil, alcohol and benzine, together with the problems of iron, coal and power, constitutes one of the most important points of the revised development plan. Consequently, the Government has decided to expedite the production of these substitute fuels by utilizing the abundant coal and oil shale to meet the demands of the national defence industries of Japan and Manchoukuo.

Coal liquefaction, though very advantageous on account of the abundance and cheapness of coal, is still in an experimental stage technically in every country of the world. Difficulties are expected but factories for the use of the direct or Berguis method, the Low Temperature Carbonization Method and Gassynthese are now in course of construction and are expected to yield promising results.

In accordance with the needs of the situation which will demand more liquid fuel than before and also in view of the existing state of raw materials, the Government in the revised plan intends to produce 2,000,000 tons per annum by overcoming difficulties and bringing together all kinds of technique, home and foreign.

As to the shale oil industry which is already under operation, a great expansion of the Fushun factory and exploitation of other new resources are expected to be realized. The expansion works at Fushun are making good progress and the exploitation of new resources is ready for realization as investigation and prospecting are carried out smoothly.

Expansion of facilities for alcohol making is also being planned. For this, enforcement of a monopoly system and other measures are projected.

Electric Power

It is needless to say that so-called "white coal" is essential for the progress of modern industry and is the most important element of productive power.

Our country is blessed not only with abundant coal for power resources but also hydro-electric power resources.

To speed up the development of hydro-electric power is a pressing need of the moment. In the five-year plan, exploitation of the No. 2 Sungari, the Yalu and its tributary, the Mutan river is contemplated. In the revised plan generating equipment for 1,300,000 kw. is to be furnished. First-stage construction along the No. 2 Sungari and Yalu can indeed be classed among the gigantic works of the world and the respective work is making good progress. When these power plants begin to turn out electricity, they can supply ample electric power to the country.

Coal-power stations which will supply electric power prior to the completion of hydro-electric plants and which will be supplementary equipment after the completion of the plants are to be expanded to 1,300,000 kw., twice the present capacity. Meanwhile, transforming equipment and a net-work of large transmission lines to supply electricity all over the country are now being planned.

Manufacturing Machinery, Motor-car, Aeroplane

To promote motor-car and aeroplane construction and to realize the establishment of machine industry are important items in the revised development plan. In order to realize these enterprises, it is necessary to make every effort to prepare the necessary material for construction, and to obtain technical experts, skilled workers and so forth. In Manchuria, though still in their infancy, there are machine manufacturing or assembling factories which have been operating for some time already. In order to expand these factories the Government has devised a scheme for realizing the establishment of machine manufacturing on a large scale. The recent establishment of the Manchuria Heavy Industry Company will no doubt play an important rôle in the realization of this plan.

Aluminum, Magnesium

Our country abounds in aluminium shale. With the development of cheap and abundant supply of water power, the Government is planning the expansion of equipment to produce 30,000 tons a year to meet the demands of Japan and Manchoukuo.

The experimental plant at Fushun, which has as its purpose the conducting of experiments in aluminium production and to produce 5,000 tons a year, is almost completed and is ready to bring its products to market. Furthermore, the plan to produce aluminium is now under consideration along with the development of the Yalu and other hydro-electric plants.

In the district around Tashihchiao there is a large deposit of magnesite which is estimated at around 1,000,000,000 tons. A plan is now under consideration to establish a large plant to produce 3,000 tons of magnesium annually by utilizing this magnesite.

Lead, Zinc, Copper

As a result of successive investigations, fairly good mines have been discovered in Manchoukuo and the Government is planning to exploit them. In the revised plan, the Government aims at increasing the output of lead and zinc, besides including copper in its categories.

Salt, Soda-ash

In Japan the soda industry has made remarkable progress recently, but industrial salt, raw material for the soda industry, must be supplied in large quantities from abroad. So in Japan the need to secure a supply of salt is keenly felt, but fortunately, in Manchoukuo, it is possible to construct new and vast saltfields cheaply. In the five-year plan, it is expected that 1,500,000 tons of salt will be produced annually by improving the existing saltfields and by hastening the construction of new saltfields by the Manchuria Salt Industry Company.

Artificial Fertilizer

Among the artificial fertilizer industries, the ammonium sulphate industry is closely connected with national defence. The Government expects an increase in the home consumption of ammonium sulphate in connection with the cultivation of specific crops such as tobacco and cotton, for which the Government has adopted a positive policy in encouraging the farmers to plant them. Furthermore, taking into consideration the promotion of agricultural products in North and Central China, it is necessary to increase the production of ammonium sulphate. The Government has added artificial fertilizer in this revised plan to meet the requirements of the situation.

Ammonium, sulphate is being produced on a large scale at Dairen. With the proposed plans for the expansion of the iron and shale oil industries, a fairly large amount of its by-product, ammonium sulphate, is expected. A new plant is also to be established for the sole object of producing ammonium sulphate.

Pulp

In the national self-support program the establishment of pulp resources occupies a very important place probably next to iron and petroleum. Manchoukuo has abundant resources of lumber, kaoliang and bean stalks, and reeds for pulp manufacturing. In the revised plan the Government hopes to increase pulp production by utilizing the rich virgin forests in the northern section of the country, and also expects to realize the production of 400,000 tons annually from other sources. This proposed plan is believed to be a very effective measure for meeting the needs of the present situation.

Gold

By the five-year plan, production of gold was at first sought chiefly by exploiting the alluvial gold beds in the northern section of the country. In the revised plan, proper measures are devised to accelerate the exploitation of other existing gold mines in addition to the exploitation of alluvial gold beds.

Promotion of Agriculture

The permanent key-note of economic progress in Manchoukuo depends after all on agricultural economy. Keeping in step with the needs and trends of the times, there is a wave of strong industrialization in Manchoukuo, and yet the economy of farmers who occupy the greater part of the population of the country is the backbone of Manchoukuo's national economy.

Generally speaking, modern manufacturing industries are centered mainly around those pertaining to the processing of farm produce, and so long as the present industries in Manchoukuo such as bean oil industry, cotton spinning industry, flour milling industry, hemp or flax industry depend on the raw materials of agricultural products, the importance of the development of agricultural products cannot be underestimated. Since the five-year plan was formulated to strengthen national defence and to promote national interests and the people's welfare by expanding the productive capacity of the country, the development of farm products cannot be neglected. To be self-sufficient in raw materials and food stuffs is essential in times of war or emergency and the promotion of agriculture in Manchoukuo is thus an extremely urgent task.

It is a truism that agriculture is influenced decisively by the efforts of those engaged in agriculture and by natural forces such as soil, weather conditions, etc. Agriculture is not yet sufficiently organized scientifically in this country; agricultural institutes, training courses for farm instructors and special courses for farmers are not as yet what they should be. Efforts are being made by the authorities to improve and increase crops through the free distribution of good seeds and by instituting training courses for farm instructors, etc. In addition, the Government has established a system of agricultural associations to solve the problems of rural communities and to systematize present farming gradually so as to effect a fundamental reorganization for the farmers' prosperity and welfare. Further scientific investigations are necessary; traditional customs and interests must be re-examined; and rational utilization and arrangement of cultivated land, investigation of calamity percentages, conditions of immigrants' settlement, etc., need to be carried out.

A general outline of leading crops is as follows:

(*a*) Soya beans hold the premier position among farm products. In order to increase the exportation of soya beans, the Government has expanded the first plan so as to produce approximately 4,500,000 tons this year. Taking the supply to Japan and North China into consideration, the output of kaoliang and maize is expected to be 4,500,000 tons and 2,300,000 tons, respectively.

(*b*) For the purpose of self-sufficiency, the Government has expanded the first plan to increase products as follows: 400,000 tons of rice, 1,350,000 tons of wheat and 210,000 tons of sugar beets.

(*c*) The production of oats and flax will be increased so as to meet increased demands.

(*d*) Output of hemp and barley will probably be less thit year than the first estimated plan considering the firss year's results.

Improvement of Live Stock

Because of the existence of vast pastoral lands, abundant feed supply and the nomadic nature of a considerable number of the people, the live stock industry has a very promising future. For the sake of the farmers' welfare and the requirements of the situation, it is very necessary to improve the existing breeds of live stock as soon as possible.

The following measure for improvement are announced:

(*a*) The existing breed of horses will be improved by introducing other superior strains.
It will take about forty-five years to carry out the plan.

(*b*) The existing stock of sheep will be increased to 15,000,000 in thirty-five years, and most of the present species are to be replaced by improved varieties. Wool production will be raised to the level of 100,000,000 pounds per annum.

(*c*) Cattle of superior quality will be increased to 3,500,000 head in twenty years, and 2,500,000 of them are to be replaced by improved varieties.

(*d*) Hogs can be improved in a comparatively short period. At least 5,300,000 select animals will be obtained five years later. During this period the Government is to take measures to establish institutions so as to improve the variety as much as possible and to increase production during the first five years which correspond to the period of the five-year plan.

As regards the first year's results, a brief account has been given.

Communication and Transportation Systems

Fortunately, since the founding of the new State, the authorities have made constant efforts to effect unified control in railways, roads, harbors and communications. Good results have been obtained in each.

The following is a summary of communications and transportation as related to the Five-Year Plan.

Railways

Railways were formerly under the management of different bodies, which fact caused much inconvenience. Under the principle to unify all lines in Manchoukuo, operate them on a rational basis, and raise their efficiency, the Government promulgated the Railway Laws in February, 1933, and transferred the main lines in Manchoukuo to State supervision and entrusted the entire management of the Manchoukuo State Railways and the task of building new lines to the South Manchuria Railway Company.

The North Manchuria Railway, which was an obstacle for many years in the unification of railways in Manchoukuo, was transferred from the Moscow Government to Manchoukuo in March, 1935, and the Government under a contract signed on March 23, 1935, entrusted the management of the newly acquired line and its affiliated enterprises to the South Manchuria Railway Co.

Since the founding of this State, a total of 3,500 kilometers of new lines has been completed. If existing lines and the North Manchuria Railway line are added, the length of State Railways reaches 8,300 kilometers and, further, by adding the South Manchuria Railway lines extending 1,100 kilometers and 200 kilometers of private railways, the total mileage of railways reaches 9,600 kilometers. The construction of these new railways has enabled the light of civilization to reach even the remotest parts of the country.

In 1937, the expansion of the State Railways and private railways was carried out according to program. This year plans have been drawn up to establish lines in the Tungpientao district in order to aid the exploitation of new industries there. The Government also assists private railways in order to let them contribute to the development of local industries.

Roads

Roads at the time of the founding of this State were quite undeveloped and primitive excepting those which were specially built for modern motor transportation purposes and which may be called highways in the modern sense of the term.

With the establishment of Manchoukuo, a new era of highway construction dawned upon Manchuria. The Government early realized the need of modern highways in connection with its program of general industrial development, maintaining peace and order, and spreading the light of civilization. It thus adopted a national policy of newly constructing or improving highways within a period of ten years. Execution of this scheme was actually started in September, 1932, and by the end of 1937 a total of 11,000 kilometers of State highways had been constructed.

In 1937, good results were obtained in construction and improvement work. Starting from the end of 1937 the execution of this scheme stepped into the second-stage five-year road construction plan and the progress of the program will no doubt contribute greatly to the improvement of industrial and economic conditions.

Motor Bus Lines

In order to introduce modern bus lines into Manchuria, the Government has followed a program of bus-line construction which was established soon after the founding of the State and the execution of this plan is steadily progressing.

The Manchoukuo Government had entrusted the General Direction of Manchoukuo State Railways, with the exclusive right of operating all important bus lines which have close connection with national defence, the maintenance of public peace and also the development of national industries. The bus lines over other highways are open to free enterprise but the Government exercises strict control over them under the general policy of "one highway, one bus line." The total length of all bus lines in Manchuria is 20,000 kilometers.

In addition to the above lines the Government has newly worked out a four-year extension plan beginning this year in order to meet the needs of national defence.

Harbors

The coastline of our country is short as compared with its vast territory and the country is not blessed with good harbors. Only three ports, namely, Antung, Yingkou and Hulutao may be mentioned, besides Dairen which is in the Kwantung Territory. Both Antung and Yingkou freeze in winter, which is a great detriment to the growth of good harbors. However, the development of national industries and the expanding radius of Manchoukuo State Railways has necessitated additional outlets to the sea, and since commercial relations with North China, Mongolia and other countries have become closer, rapid establishment of harbor facilities has become very urgent. The reconstruction of Antung and Yingkou harbors and the construction of the port of Rashin, which forms the future outlet to the sea from Northeastern Manchuria, together with that of the port of Hulutao, an outlet of South Manchuria and North China to the sea, are essential for the progress and development of the industrial resources of the hinterland. By the end of 1937 the first-stage construction work at Rashin and Hulutao had been completed and opened with the capacity for handling 3,000,000 and 170,000 metric tons of cargo a year, respectively. The two ports are still under construction in accordance with second-stage construction work.

Considerable improvements are also being made at the port of Yingkou and Antung. After the completion of improvement the capacity for handling cargo at Yingkou and Antung will be 3,000,000 and 2,000,000 metric tons, respectively. By adding 4,000,000 metric tons for Hulutao harbor and 9,000,000 metric tons for Rashin harbor, the total tonnage for the handling of cargo would reach some 18,000,000 metric tons a year. Moreover, parallel with the progress of the development plan, the facilities of the port of Dairen will become insufficient. Attention is being given to improving this port.

Communications

After the establishment of Manchoukuo, the need for the unification of the two different systems of electric communications, one maintained by the Manchoukuo Government and the other by the Kwantung Government was keenly felt by both sides. The two Governments finally reached an agreement on March 26, 1933, to consolidate their respective electrical communications by establishing the Manchuria Telephone and Telegraph Company. It not only controls and manages all telegraphs and telephones, but radio broadcasting as well in the whole area of Manchoukuo. At the end of 1937 the total length of telegraph lines reached 48,000 kilometers.

In the field of wireless telegraphy, the company has completed facilities for wireless telegraph stations in such leading cities as Hsinking, Mukden, Harbin, Dairen and others. The company not only established a domestic service but also inaugurated an international wireless service with leading Powers such as Japan, the United States of America, Germany and France and contributed greatly to international communications. Telephone lines are 114,000 kilometers in length. The wireless telephone has also become a connecting link among the leading cities of Japan and Manchoukuo and its use is growing day by day. Radio broadcasting plays an important rôle in modern days and the company has taken steps for the improvement or expansion of Hsinking and the other stations.

Needless to say, in carrying out this gigantic plan active collaboration of the various organizations concerned is essential, official and private, technical and monetary. About MY5,000,000,000 is expected to be required for the period beginning with the second year of the program, and this sum is to be raised from different sources, including the money markets of Manchoukuo and Japan. Capital from western countries is also welcome, and due consideration is to be given by the authorities for the interests of prospective investors.

Trained technicians and skilled workmen, among others, are needed in all the fields of activity. For this reason graduates of engineering schools and colleges are eagerly sought while special short courses are being instituted to train men to meet urgent needs within the shortest time possible. Those in charge of the planning are likewise giving full attention to the problem of acquiring the building materials and other necessary equipment for the execution of the works.

Above all, special care is exercised to secure smooth coordination of all the departments of activity—planning, industrial, transport, agricultural, financial, etc.—as well as human factors, for it is after all the Man behind the motor or the plough who must propel the forces required to run the entire machinery of this five-year plan.

Japan's Economic Position in 1938

(Bureau of Foreign and Domestic Commerce, U.S. Department of Commerce)

THE economic progress Japan has been enjoying in recent years was slackened during 1938 in the face of effective control measures, drastic reductions in exports to foreign-currency countries, increased costs of the Sino-Japanese hostilities, and diminishing revenues, according to a report from the Office of the American Commercial Attaché, Tokyo. However, business was fairly well sustained because of demands brought about by the military situation and no fundamentally disrupting forces were encountered, largely as a result of the intense patriotic spirit of the people and their co-operation with the Government.

As in 1937, the past year was characterized by a further intensification of planned economy, necessitated by a sharp increase in the general and military budgets, the need for adequate supplies of military materials, and the Government's major policy of expanding the nation's productive power. Through the medium of numerous legislative measures—principally the Temporary Capital Adjustment Law, regulating the flow of capital; the Temporary Measures Regarding Exports and Imports, restricting or prohibiting the export or import of any commodity; and finally, the General Mobilization Law—many additions were made to the sweep of State control. Practically every phase of business, financial, and industrial activity was subjected to rigid limitations. A few outstanding effects of these measures were: An advance in commodity prices to the point where Japan's export products were less competitive in world markets; a reduction in foreign trade; a substantial advance in living costs; a decline in liquid assets of business concerns through the purchase of national bonds; a loss of 60 per cent in tourist receipts and a sharp decline in remittances from international shipping; and the necessity for a large number of small- and medium-sized industrialists to change the nature of their enterprises altogether or to close down their plants.

Industrial Activity and Demand for Labor Increased

On the other hand, there were a number of developments which offset to some extent the adverse effects of the control program. In the first place, the productive power of the nation was notably enlarged. Industrial activity was unusually well maintained, particularly in munitions and allied industries; and although the spread of activity was very uneven, peacetime enterprises did not suffer as badly as might be expected, owing largely to the almost complete prohibition of imports of competitive products. The augmented demand for skilled and ordinary labor and military conscription solved, to a large extent, the unemployment problem. Actual earnings from the munitions boom mounted rapidly and the Government's saving and thrift campaign received nation-wide support.

Industrial expansion continued the basic principle of the Government's economic program, but the exigencies of the military situation demanded that first consideration be given to heavy industries. This brought about a widespread shifting of factory operations and resulted in a marked expansion in the output of munitions and allied products, but a substantial decline in the production of goods for export and for domestic consumption. It is conservatively estimated that production in heavy industries registered a gain over 1937 of around 75 per cent, while the output of peacetime industries, including many types of goods for export, fell off by about 30 per cent.

Intensified efforts were directed toward self-sufficiency in all materials. The output of such products as aluminum, wood pulp, magnesium, ammonium sulphate, steel alloys, alcohol, and certain synthetic materials, such as marine leather rubber artificial wool made from soy beans, and various textile and fuel substitutes were greatly expanded under official encouragement. Likewise greater use was made of domestic low-grade raw materials.

Rise in Commodity Prices Met by Increased Purchasing Power

During the early months of the year there was a vigorous rise in commodity prices, engendered by restricted imports, shortage of stocks, curtailed supplies of consumption goods, and some profiteering. The upward tendency was arrested in a measure during the latter months by activities of the official price-fixing committee. The average index of wholesale prices in November showed an increase of 3.5 per cent over January. Broader and steadier advances occurred in retail prices, the January average of 190.4 advancing to 211.9 in November, a spread of 11.2 per cent. Purchasing power, however, also advanced because of higher wages, larger farm income, increased industrial employment and the higher average of business earnings, largely the result of the unusual profits accruing to heavy industries.

Agricultural Conditions Unfavorable Despite Higher Income

Although national farm income in 1938 was estimated to have gained 2.7 per cent over 1937, general conditions in rural districts were not considered favorable. The chief retarding factors were the large number of floods, unseasonal heavy rains and several typhoons which caused a serious reduction in practically all crops except rice. A secondary deterrant was the labor shortage brought about by the large number of men drafted for military service. Also young men were attracted to the cities by the comparatively high wages paid in munition factories.

It is believed that the higher production costs and official restrictions on prices of many agricultural products, as well as a substantial advance in general commodity prices, offset a large part of the gain in farm income.

The subjection of foreign trade to strict State control, the very patent division of exports into shipments to foreign currency and yen-bloc countries, and the sharp declines registered by both exports and imports were outstanding developments during 1938. The Empire's exports, valued at Y2,897,000,000, declined by 13 per cent, and imports totaling Y2,836,000,000 represented a drop of 28.5 per cent from 1937 peaks. The year's trade showed an export excess of about Y60,000,000, compared with an import excess of Y636,000,000 in 1937. From the standpoint of foreign exchange, however, the position was not so encouraging for exports to other than yen-bloc countries for the first 11 months fell off by 38 per cent and imports declined by 40 per cent. On the other hand, exports to yen-bloc markets advanced by 47 per cent and imports by 26 per cent. Even including these areas, heavy declines were recorded in shipments of cotton textiles, raw silk, and rayon tissues, and in imports of raw cotton, wool, pulp, rubber, and lumber.

The bulk of exports was still in manufactured goods, and raw materials continued to constitute the greater part of imports. Semi-manufactured goods lost ground in both exports and imports, while foodstuffs gained both ways. The largest deviations occurred in exports of foodstuffs and imports of manufactured goods. Because of increased shipments of refined sugar and wheat flour to yen-bloc countries, the share of foodstuffs in Japan's total export trade advanced to 11.4 per cent from 7.6 in 1937. Manufactured goods accounted for 17 per cent of the total import trade, compared with only 10.6 per cent in 1937, the increase being attributed largely to heavier purchases of refined mineral oils, metalworking machinery, aircraft and parts.

From a geographical standpoint trade with every continent and country, with the exception of Asia and the yen-bloc areas, dropped well below the 1937 percentages in total trade. Asia's share was slightly above 50 per cent against 43 per cent in 1937.

Trade with United States Shows Sharp Recession

Trade with the United States ebbed to the lowest level since 1934. Exports declined by 37 per cent and imports by 30.5 per cent, compared with 1937, whereas in that year exports increased by 16 per cent and imports by 60 per cent over 1936. Our share of Japan's total trade for 1938 was only 20.5 per cent against 27.5 for the previous year. However, the ratio of imports from the United States advanced from 33.5 per cent to slightly over 34 per cent, while that for exports to the United States declined

(Continued on page 209)

Tokyo Bids for World Leadership in Office Building Construction

New Earthquake-Proof Home of First Mutual Life Insurance Company has Four Floors Underground that No Air Bomb Can Touch

By W. HARVEY CLARKE, Jr.

Unique among great modern business structures, not only in the Far East, but anywhere in the world, is a commanding grey granite pile fashioned by Japanese engineering genius that has just risen in Tokyo to house the Home Office of The First Mutual Life Insurance Company. Aside from every modernistic facility in internal equipment the designers of this fire and earthquake-proof building displayed an awareness of the hazards of modern warfare by providing four entire floors underground that no air bomb can touch.

This imposing steel and re-inforced concrete edifice faces the outer moat of the Imperial Palace grounds near Hibiya Park. Covering a 4,075 sq. meter land area and with 46,552 sq. meters of floor space, its massive, unadorned, grey-white granite form rises through ten floors, including a mezzanine and two penthouse stories, to a height of 38.5 meters. Four basement levels extend underground to a depth of 21.2 meters. A total of fourteen floors makes it the tallest office structure in the Japanese Capital. Its every detail evidences marked proficiency in present-day construction engineering development.

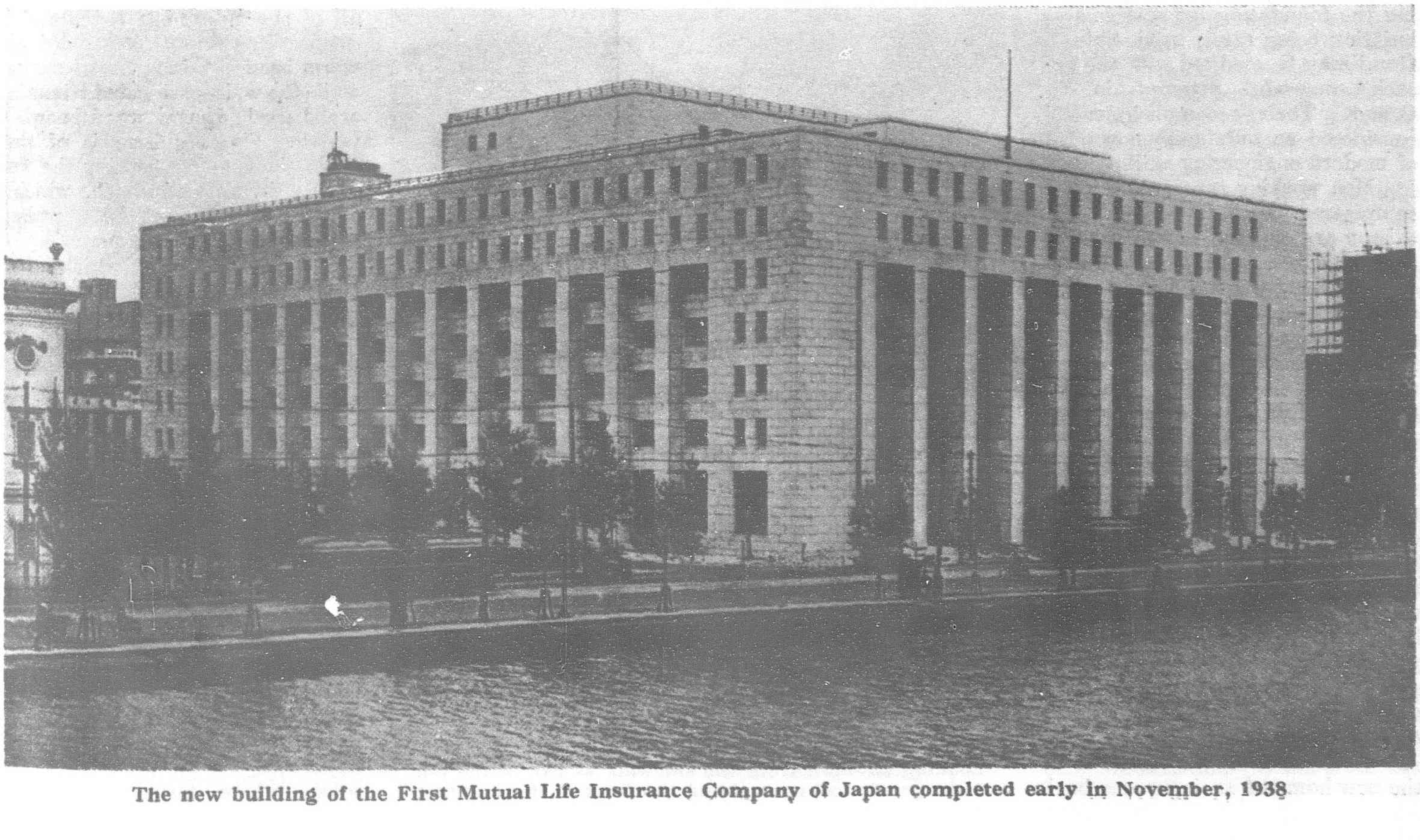
Designed by Messrs. H. Watanabe and Y. Matsumoto expressly to accommodate the expanding business needs of the First Mutual Life Insurance Company, this height-limit building cost—including Y1,820,000 paid for the 5,560 sq. meter lot site—approximately 16 million yen, or 3.8 per cent of the company's total assets. The contracting firm of Shimizu Gumi was confronted with a major constructional task in overcoming difficult topographic and geologic irregularities that made it impractical, in this case, to apply the usual excavation and pile-driving process preparatory to laying the foundation. For the nature of the work entailed, the building itself was actually erected within the noteworthy time of three and a half years between April, 1935, and November 3, 1938, when it was ready for occupancy.

Site Once in Bay

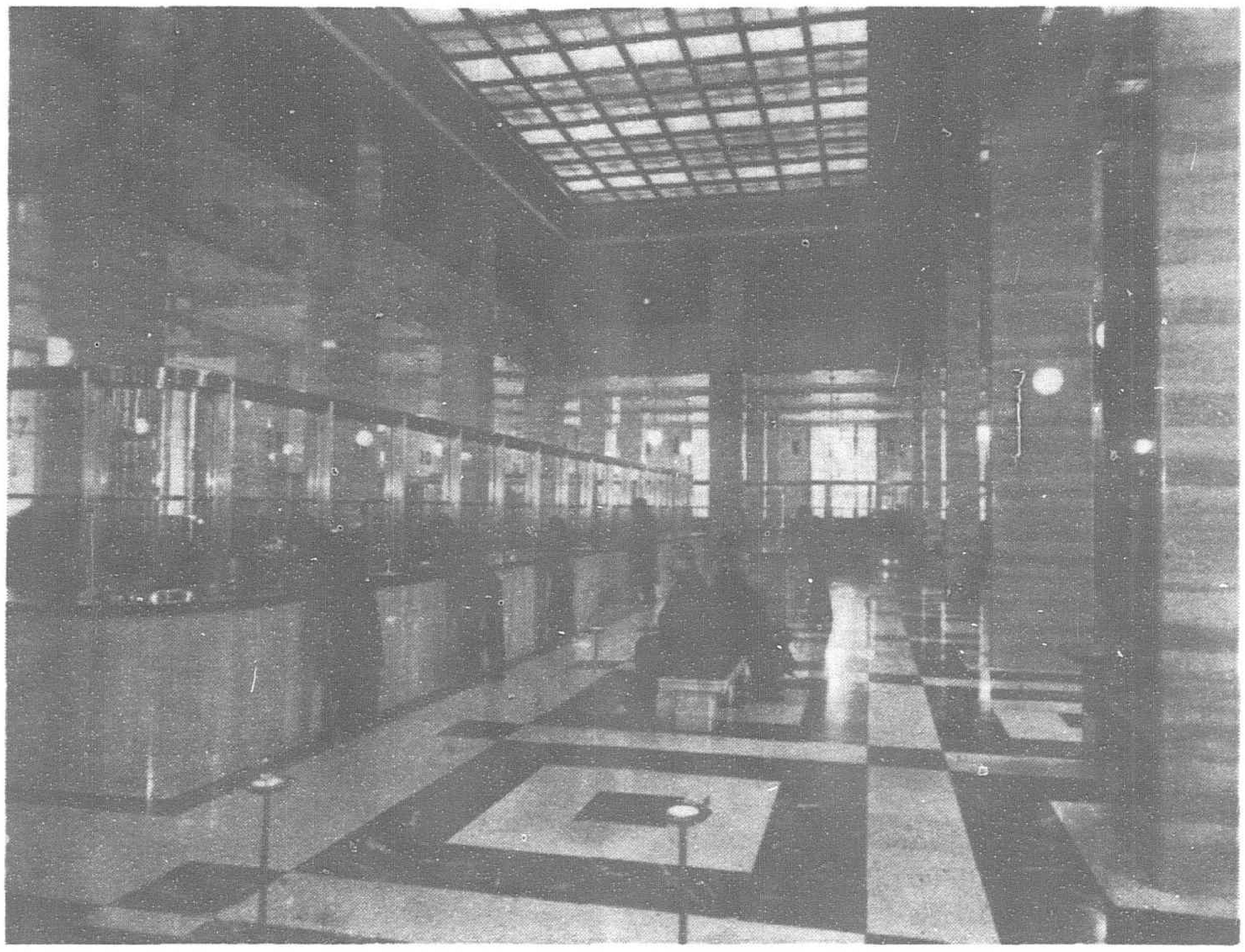
Old maps and records dating from about 1850, during the Yedo Period, and even before that time, show the site of the lot to have been beneath the shallow water of Tokyo Bay. The fact that in comparatively recent decades the land where construction was to take place had been reclaimed was confirmed when preliminary prospecting revealed the ground to be soft, weak and the sub-soil water soaked. Moreover, considerable seismic displacements during the Taisho Earthquake in September, 1923, had made the sub-strata in this section of the city unstable. For these reasons it was advisable to determine upon a practicable method for the foundation work of the projected building.

After a year's intensive survey of specific conditions obtaining at the site of the lot, conducted until March, 1934, by the Earthquake Research Institute of the Imperial University, it was decided as a result of the problem being thoroughly investigated by Messrs. Saida and Suzuki under supervision of Dr. Mishio Ishimoto, head of the Institute, that the base of the new building must be set on firm tertiary formation.

The plan, originally, was to drive several shafts to bedrock and then set supporting steel piles upon it. But extensive draining operations required with such shaft digging would probably have caused the ground surrounding the site to give way before the foundation was well begun. Finally, the idea of driving shafts



The new building of the First Mutual Life Insurance Company of Japan completed early in November, 1938 after enclosing the lot from surface to bedrock by some means to prevent water seeping in from adjacent areas, was considered feasible. This conclusion led to the caisson method of foundation construction being adopted, a procedure commonly resorted to only for bridge building and tunnel boring when work is carried on under water.



Soft-hued Italian marble lends an atmosphere of beauty to the pillars, walls and floor of the central reception hall

Caissons Are Sunk

Fifteen ferro-concrete caissons, having ceilings but bottomless and most of them 25.15 meters long by 7.58 meters wide, after being constructed on the ground surface, were sunk around the area to be occupied by the building. These box-shaped structures slowly sank under their own weight as the workmen, who went in and out through ceiling vents, dug away the earth from the inside. To eliminate the inflow of subterranean water, compressed air was constantly released into the caissons while digging was in progress. From time to time the ferro-concrete walls were built up along the four sides of the gradually submerging caissons to prevent the top soil from pressing in over them. A single caisson when nearly completed weighed about 2,500 metric tons. More than 62,000 men in all were employed on the job for the caisson work, which went on continuously day and night.

Foundation Is Rock-locked

The caisson method of constructing the foundation for a large-scale building being rarely used, Shimizu Gumi may be credited with the first such successful attempt in the Orient. Their accomplishment is considered an outstanding example of modern engineering skill.

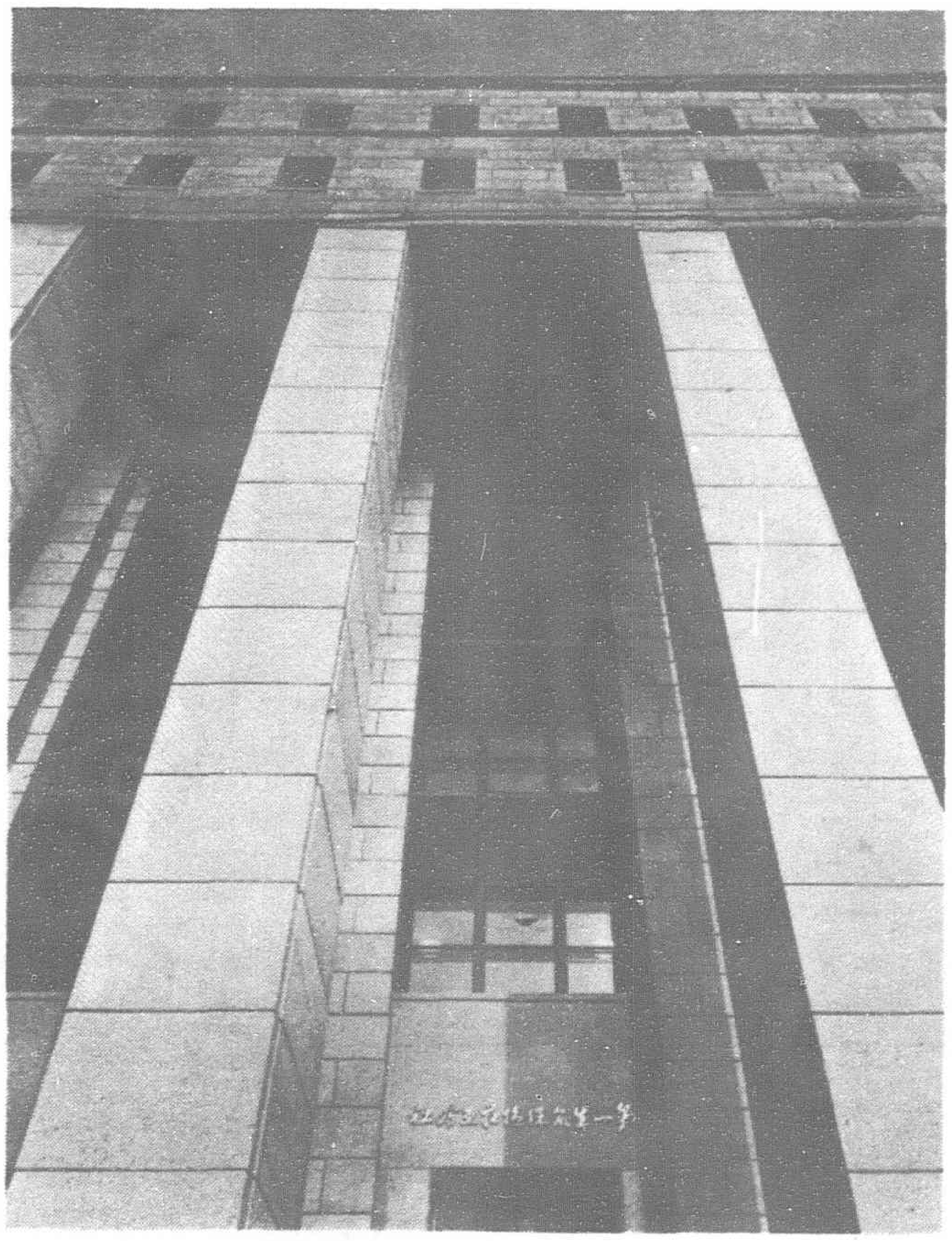
Men working continually in the compressed air atmosphere of a caisson are exposed to the bends, a malady, often fatal, that is due to sudden changes in atmospheric pressure to which workers in compressed air chambers are subjected. Despite the ever present hazard, fortunately not one death from this cause was recorded while the caisson work was under way during the eighteen months preceding April 1936.

Completion of this work meant that the site of the building was entirely surrounded by a wall of ferro-concrete boxes to a depth of 21 meters below ground level to bedrock. This whole area now freed from water seepage, it became possible to drive 79 shafts into rock stratum to receive an equal number of steel pillars to support a foundation based on solid rock.

With a building destined to be the new home of an insurance business, ornate decorative embellishments and grandiose exterior carvings were eschewed in favor of more simple architectural lines, thus lending an effect of essential beauty to the sturdy form of the quake-and fireproof structure. Along the front of the building ten huge rectangular columns rise symmetrically to the seventh floor level. Durability and safety, both inside and out, were primary constructional factors not neglected. And every available modern convenience was provided to aid in increasing the efficiency of and in maintaining a healthful environment for the future occupants.

Granite and Marble Predominate

Outside wall surfaces are faced with native granite slabs from Inada, Ibaraki Prefecture; the flat roof is laid with weather-proof clinker tile, and the spacious skylight is protected with heavily wired square glass plates. Most of the main hall on the ground floor is thus glass-ceilinged. Pavements and steps around the building also are surfaced with granite. Wainscoting, the floors of the vestibule and halls, the walls of the central reception hall and the corridors are finished in soft-hued Italian marble. Other floor areas are covered with linoleum or terrazzo. Window grilles and fixtures throughout are of white bronze or stainless steel.



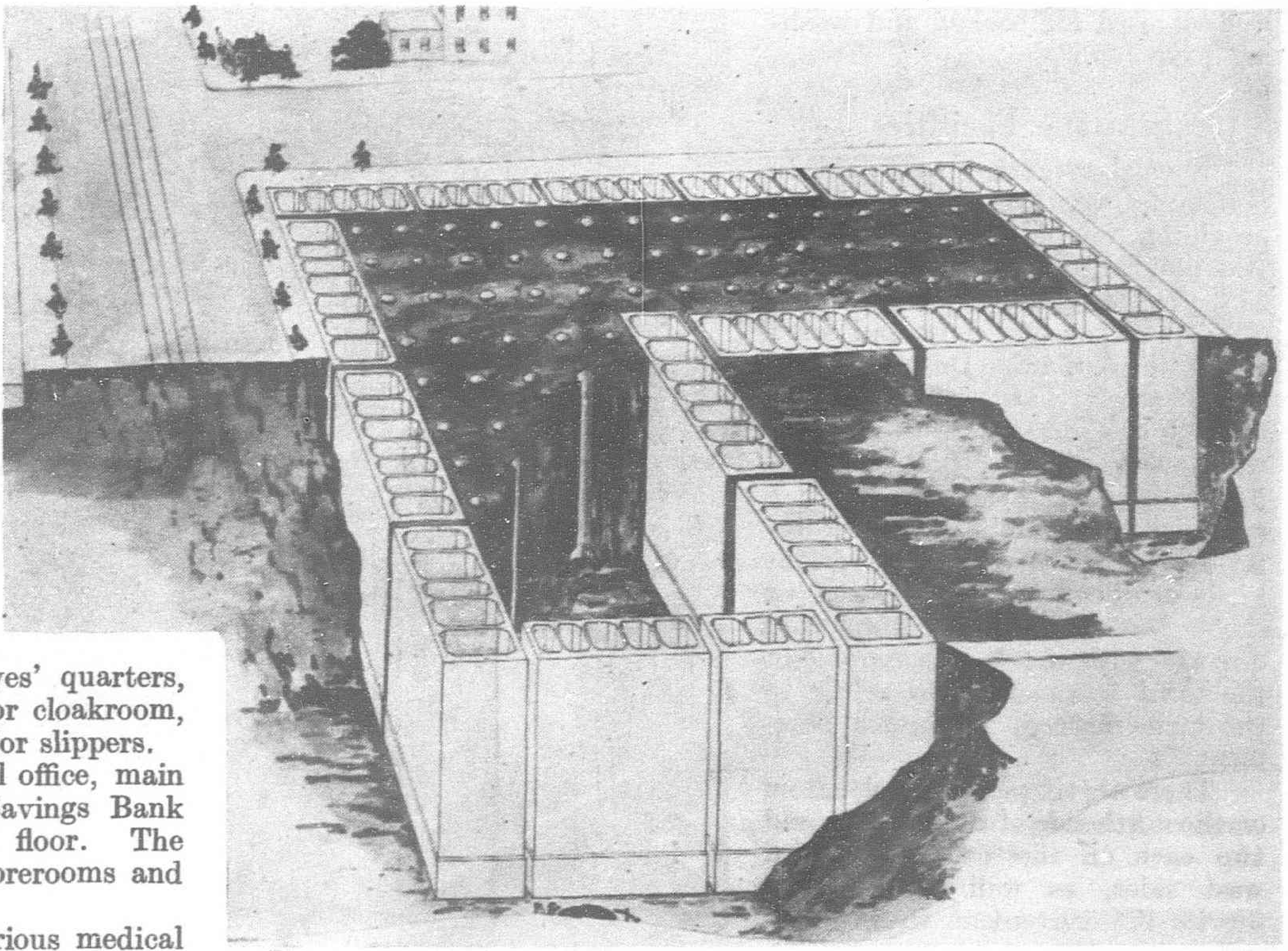
Looking skyward from the sidewalk at two of the ten huge granite columns lining the front of the building

The ceiling of the general assembly hall, on the sixth floor, is done in painted cork. The lower wall space in this auditorium, as well as all of the adjoining foyer and its supporting columns, is paneled with warm brown-stained American oak, while the wainscoting and trimmings are shaped from plywood boards to match. Flooring here is of dark green linoleum, excepting the floor of the corridor approach, which is effectively laid out with walnut-colored hardwood parquetry.

On the west side, which faces a trolley line skirting the moat, the building is equipped with double windows for soundproofing. Ground floor windows all have automatic shutters.

Floor Space Distribution

Utmost precaution was taken to safeguard important papers, such as application forms, policy registers and other documentary files. The fourth basement, or bottom floor, was designed especially for the safekeeping of such documents. Here also rooms are provided for the transformer, engine, generator, air conditioning and refrigerating units, as well as an elaborate switchboard apparatus for a one-man control room, where surveilance is kept



Sketch showing 15 caissons, weighing about 2,500 metric tons when completed, resting on bedrock 21 meters below ground surface

over the electrical and boiler systems. The temperature and the relative humidity of the entire building is regulated automatically.

Large safe deposit vaults, extra storerooms and the ventilation control room are located in the third basement.

The second basement is given over to storage facilities and pipe rooms. According to conventional practice, electric cables, ventilating pipes, feed lines and the like are bent into place between the floors and ceilings of buildings comparable in size to this one. Such practice tending to weaken the stress-bearing strength of the floors, the innovation of bending and properly installing in the second basement the main pipes leading to each room, was introduced.

The first basement is taken up with space for offices, secondary safes, employes' quarters, the night duty room and the "gesoku," or cloakroom, where visitors may change their footgear for slippers.

The central reception hall, the general office, main safe, Post Office and the First Mutual Savings Bank headquarters are located on the ground floor. The mezzanine is used for offices, additional storerooms and the telephone exchange.

On the second floor are rooms for various medical services as well as general offices.

The third floor contains the tabulating machine room and, along with the fourth and fifth floors, is provided with similar sized rooms in which most of the office work is handled.

The sixth floor consists of executive offices, the directors' conference room, auditorium and the recreation and tea rooms.

The dining hall, main kitchen and pantries make up the seventh floor, where also a small section is utilized by the employes' club.

On the roof space is allocated for a machine room, a storeroom and the water tank.

General Equipment

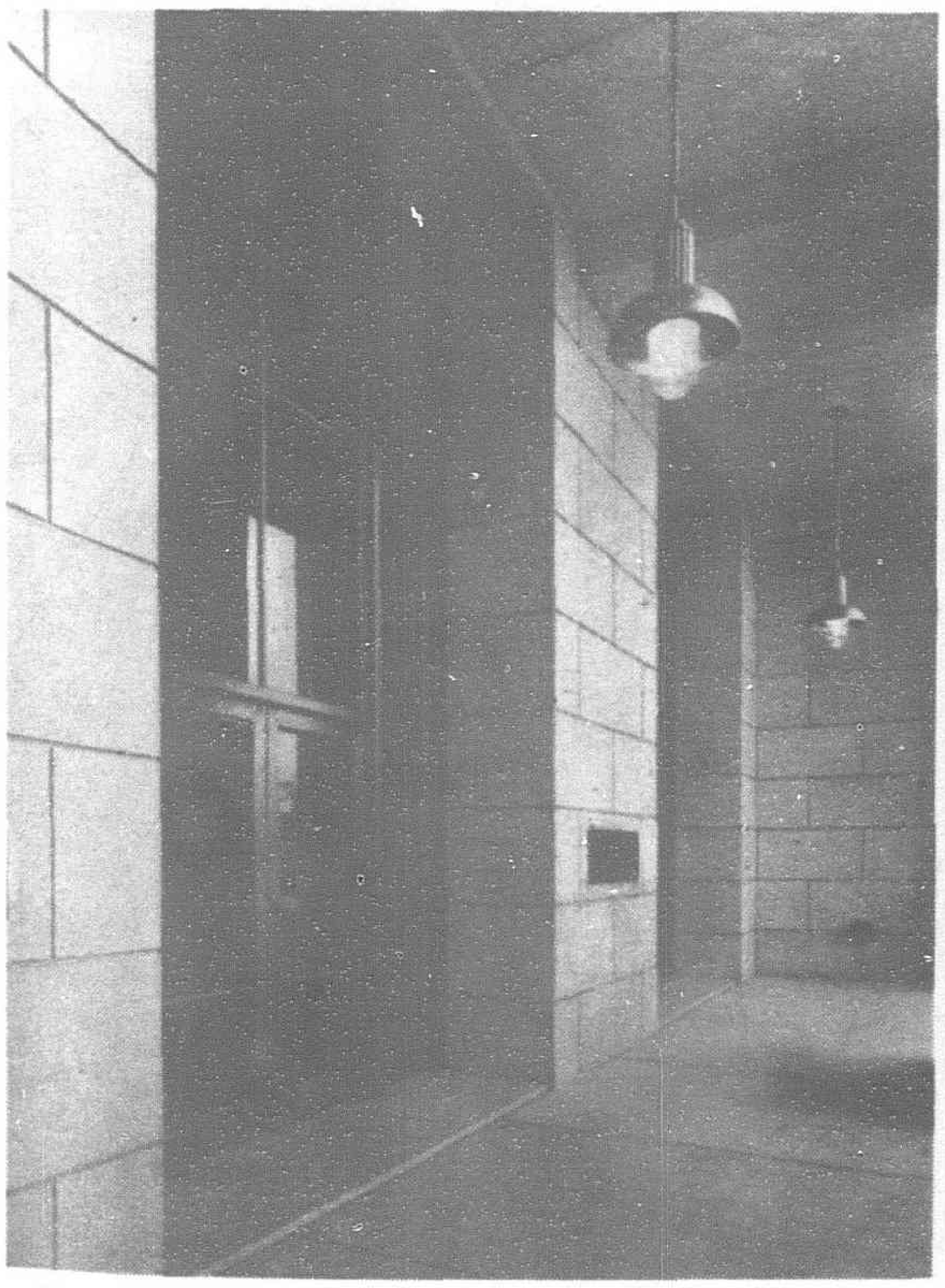
In order to distribute the proper voltage for light and power, two 22,000-volt lines have been brought into the transformer room in the fourth basement. Here the high voltage is reduced to 3,300-volts, which again is transformed to a lower voltage to meet necessary requirements. The total horse-power of the high voltage motors is 1,060 and that of the low voltage motors 1,355.

Including special light globes, approximately 5,000 electric lamps for lighting purposes are in use throughout the building. Six automatic telephone switchboards are equipped to take in 400 outside lines for 1,000 inside circuits. Besides fire alarms and night watch registers, various other indicating systems have been installed. In case of emergency, a 200 kw. generator coupled with a diesel engine is also in the fourth basement.

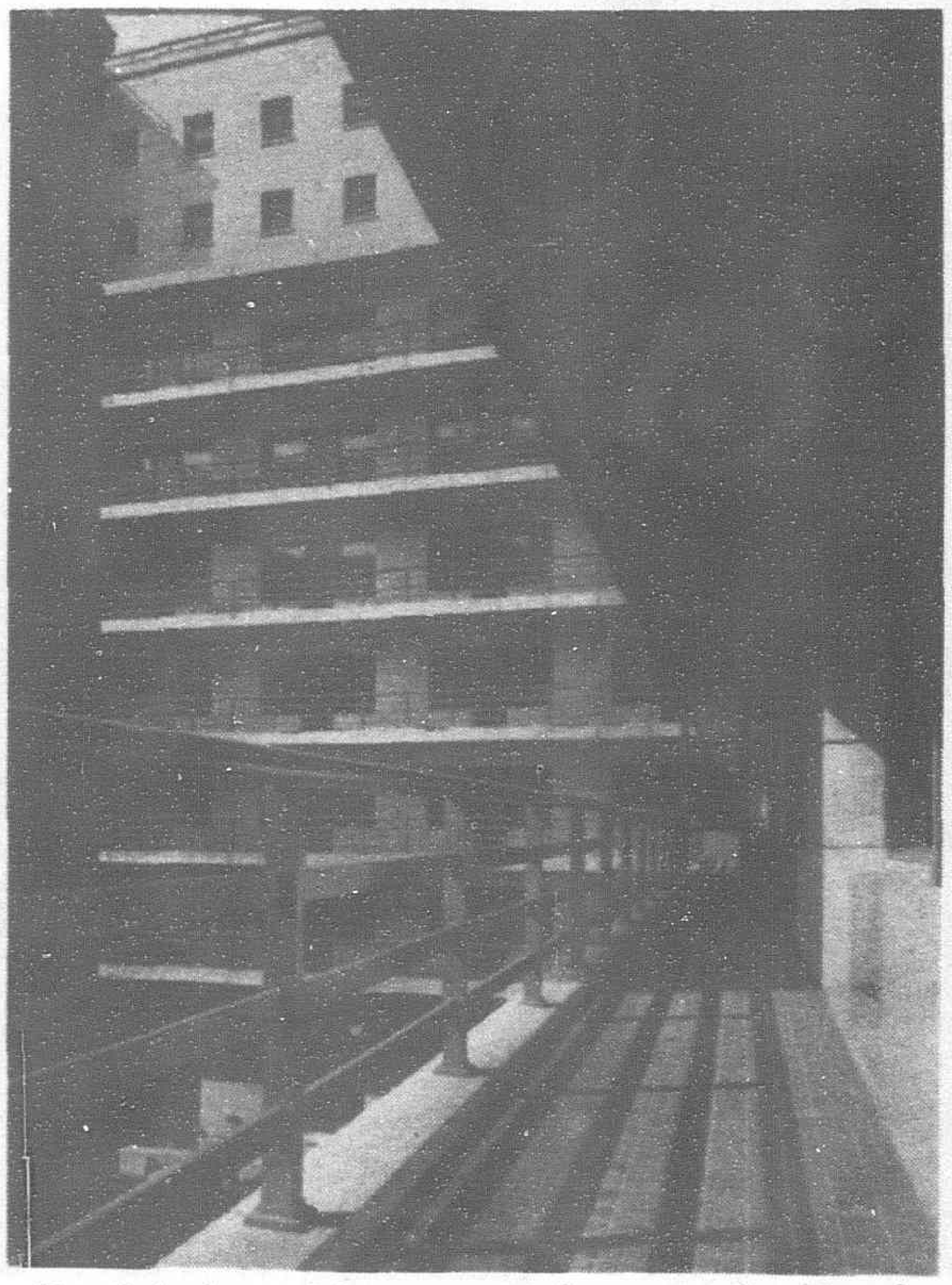
The building's total floor area being 46,552 sq. meters, one of the chief concerns was the abundant circulation of fresh air. To this end, sixteen main line ventilators were installed. Through them air purified by filtering and washing devices is sent. In winter three sets of takuma boilers are used to heat the air; and in summer one 200 h.p. and two 400 h.p. Tabo refrigerating units cool and dry the air.

Automatic heat and moisture adjusting machines send suitably conditioned air to every corner of the building. Air stagnant in the kitchens, or any other rooms, is drawn out by suction through fifteen main lines to the outside of the building.

To keep cool drinking water always in circulation, the latest Kelvinator fountains are distributed in some forty places in the building. In addition to the ordinary hot water supply, extra high temperature water is piped from the boiler room to the kitchens and the bathrooms. Aside from these conveniences, three deep wells fitted with pumps can supply about 1,191,099 gallons of water every twenty-four hours. Water from these



Granite faced main entrance with white bronze and stainless steel door fittings



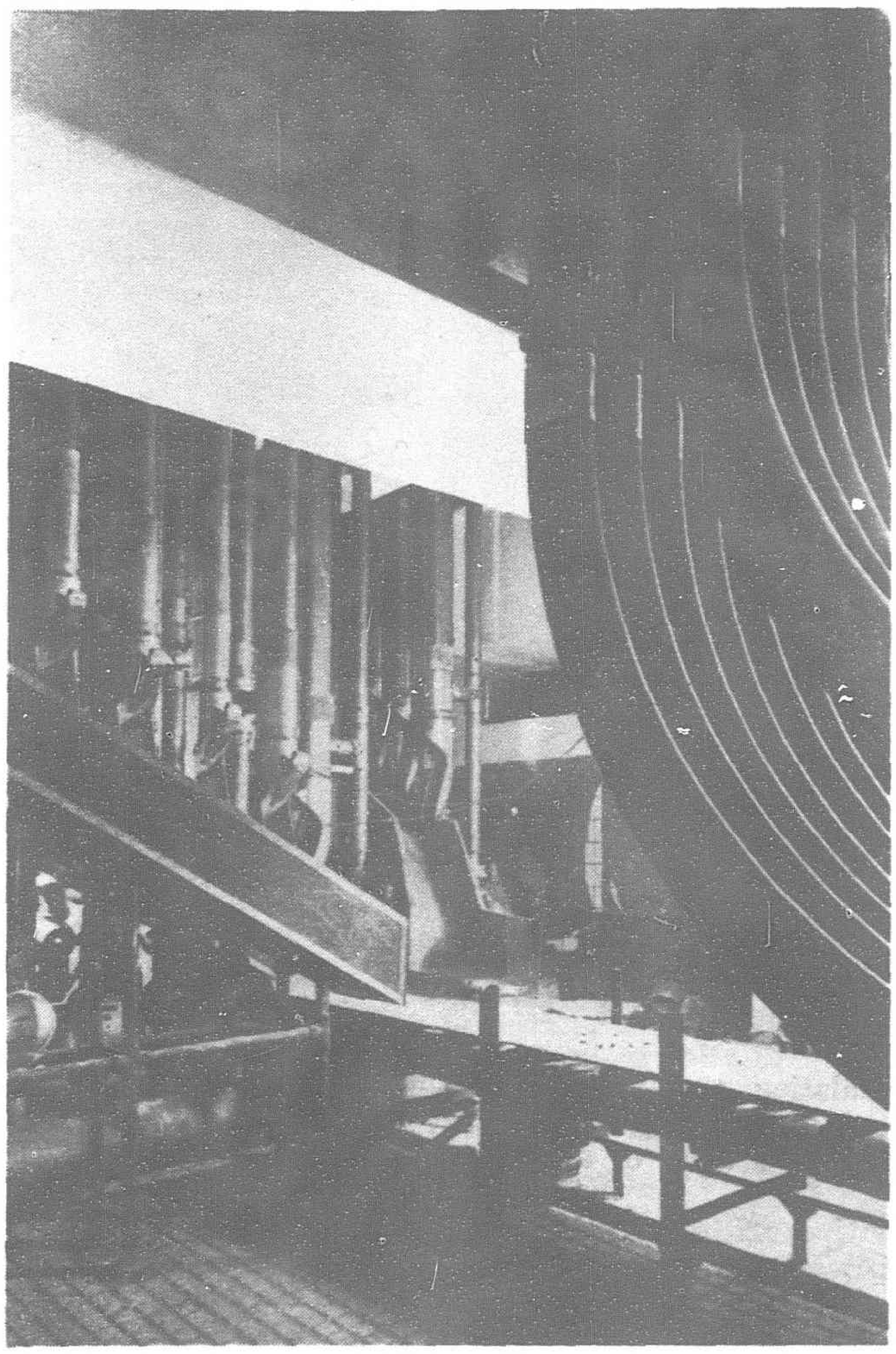
Partial view of inner court from south side of second storey railing wells is used for cooling and washing purposes.

Sanitary Facilities

Special attention was paid to perfecting ventilation facilities in providing for adequate fresh air. But besides this feature a total of 275 pipe connections for vacuum cleaners serve every room and corridor of the building. Dust, dirt and waste matter are drawn down through pipes to the third basement, where provision has been made for its disposal. On the same floor a room with a formalin-gas generator is equipped to disinfect various kinds of documentary paper. Four shoots on each floor, connected directly with the "dust room" in the third basement, lead refuse to the incinerator in the fourth basement.

There are six passenger elevators on the north side of the building and two each on the east, south and west sides, as well as a freight service lift convenient to the side gate.

The building is completely equipped with batteries of pneumatic carriers for inter-office communication. From thirty different places documents or other papers may be shot to a relay station in the third basement, from where they are transfered to their proper destination. It requires only seven seconds to send a paper from the relay station to the sixth floor above ground.



Section of relay station for inter-office pneumatic carrier systen in third basement

Apart from these facilities, each floor has six electric lifts intended to convey documents too bulky for the pneumatic carrier tubes. A third class Post Office is located on the east side of the street floor, and a duplex mail shoot delivers individual postal matter to the various offices of the building.

Interesting details about work on the structure follow :

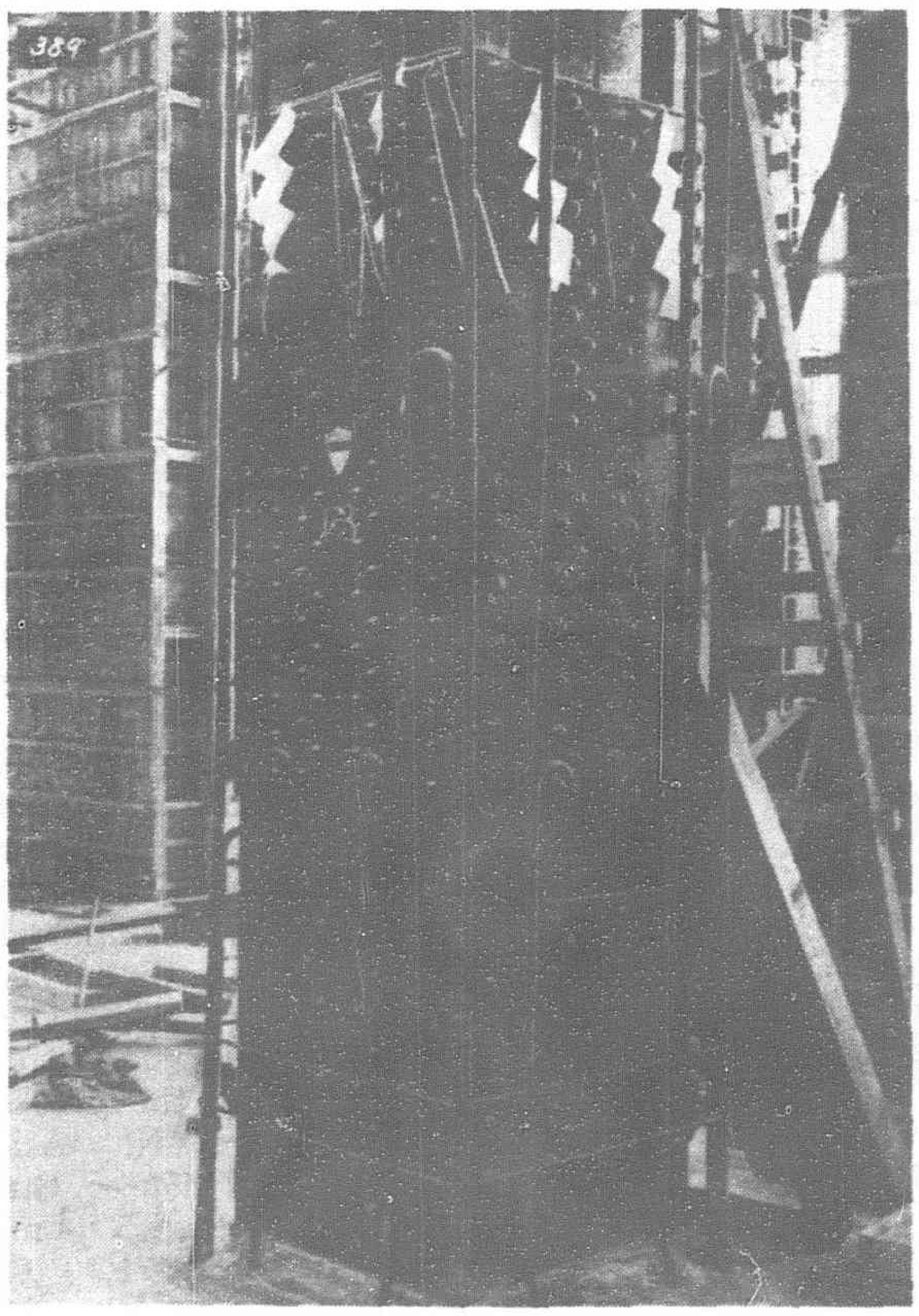
Total number of workers on job	920,000
Cubic volume ..	186,000 cubic mtrs.
Weight	161,000 mtr. tons
Length of corridors and hallways	3,500 mtrs.

MATERIAL USED

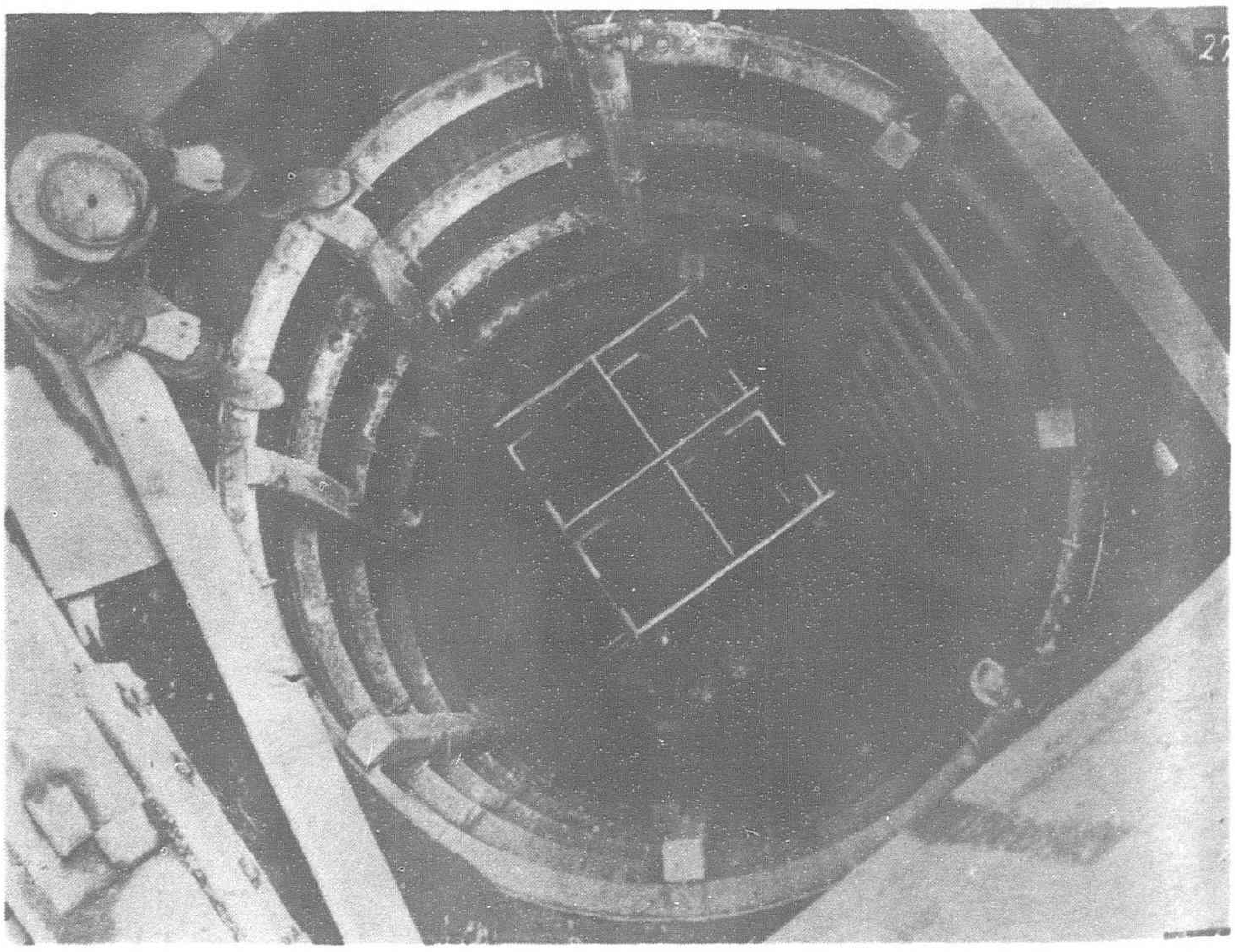
Structual steel..	9,650 metric tons
Re-inforced iron	6,500 ,, ,,
Granite slabs ..	9,500 ,, ,,
Stone blocks ..	300 ,, ,,
Cement	16,000 ,, ,,
Gravel	52,200 ,, ,,
Sand	44,000 ,, ,,
Timber	28,923.3 sq. mtrs.
Glass..	5,325.5 ,, ,,
Paint..	69,421.3 ,, ,,
Length of electric wire ..	807,500 mtrs.
Length of electric conduit pipes	225,400 ,,
Length of heater tubes	3,000 ,,
Length of tubes and pipes for hygienic accommodation, etc.	9,000 ,,

Tabulating Equipment

Use of the "punched hole method" for the actuarial department of the company dates back to 1925. But the company's tremendous growth in recent years necessitated adoption of the most modern type of electric bookkeeping, accounting and statistical machines. Therefore the company sent Mr. E. Ito for a period of study to the International Business Machines Corporation, in New York City. There Mr. Ito, after taking the required courses in

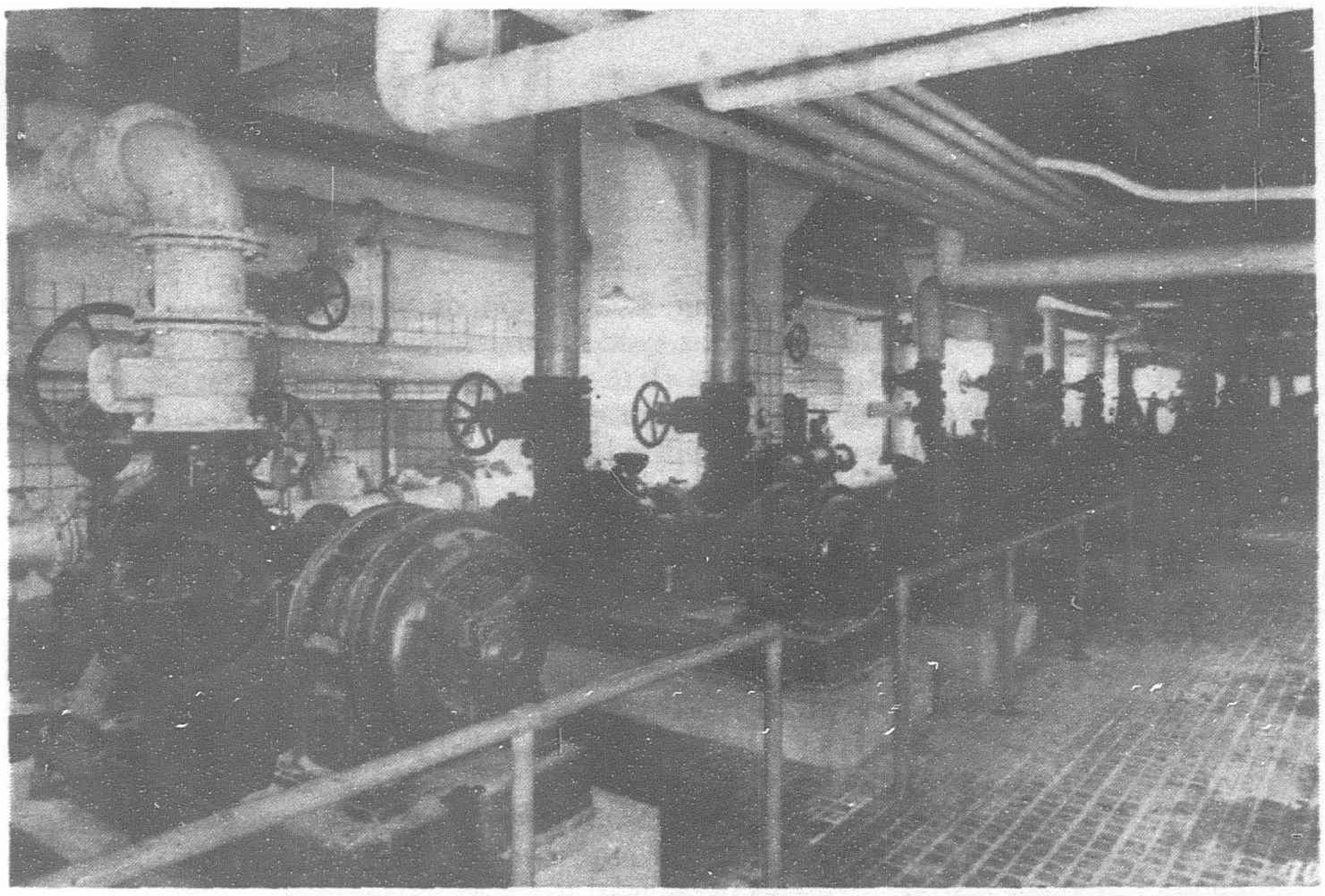


Detail appearance of a rectangular steel supporting column in partial stage of construction

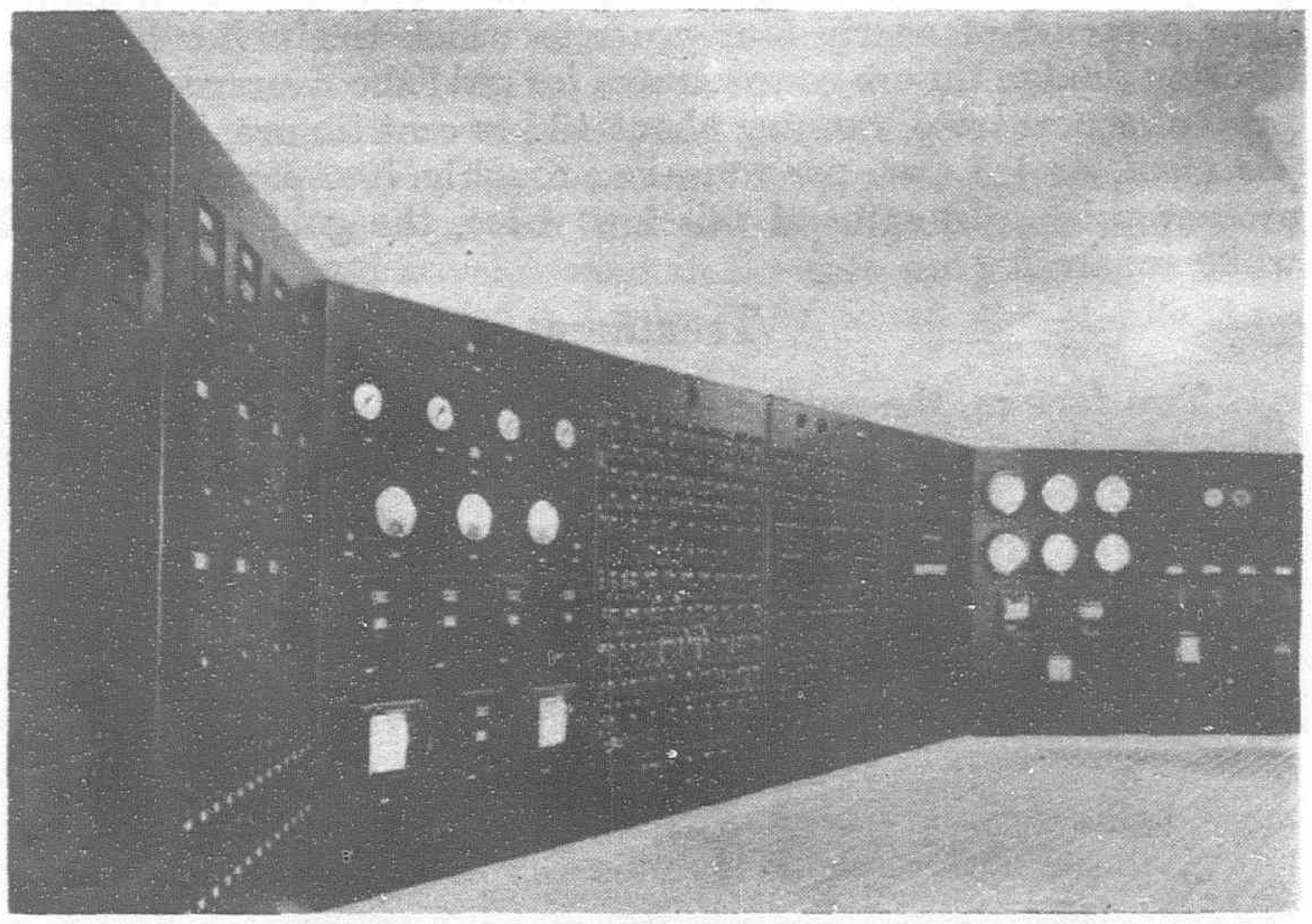


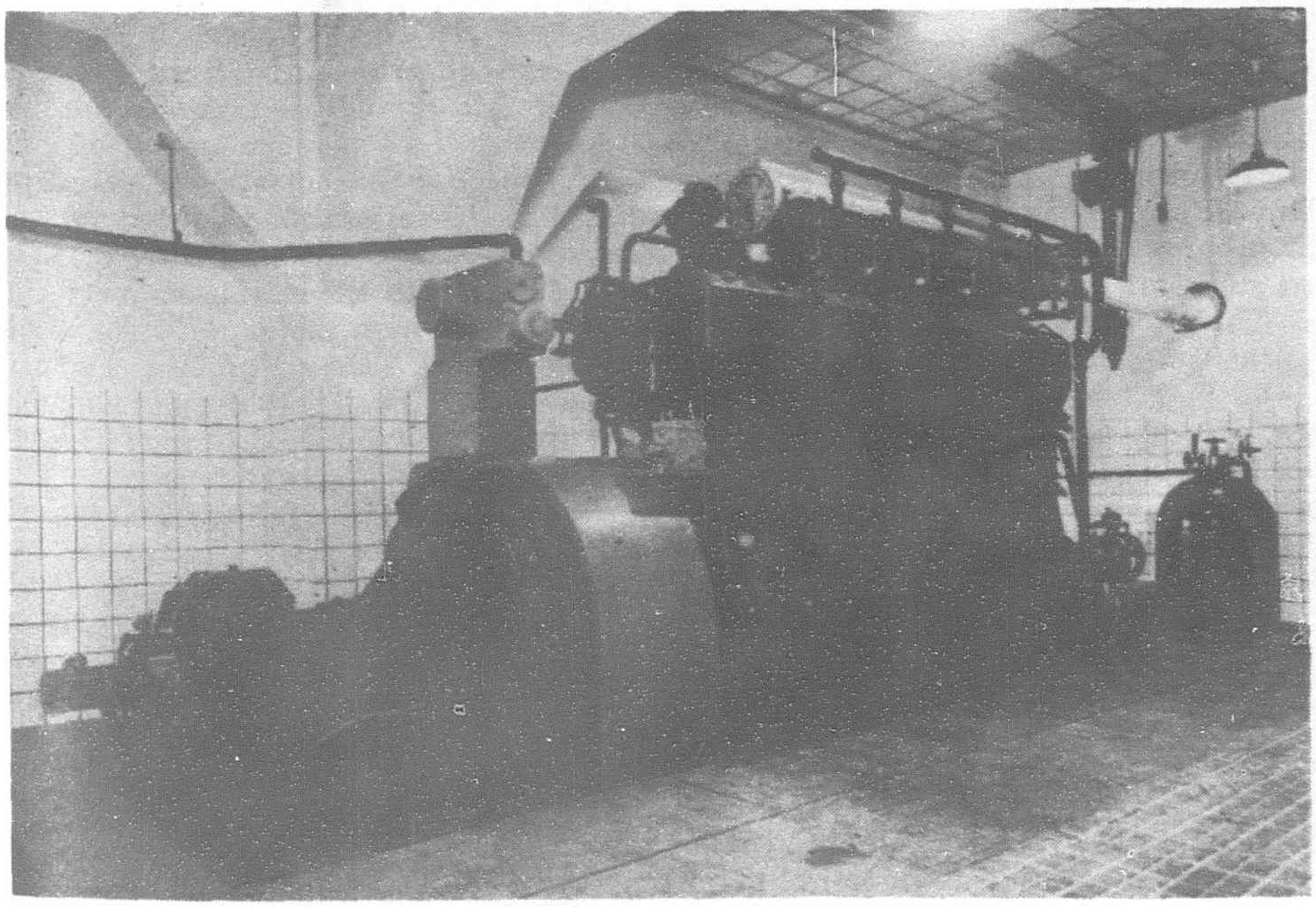
Looking down a foundation shaft set into bedrock and in which is being erected a structural steel pillar for a supporting column the I.B.M. school, visited life insurance companies in the United States and I.B.M. offices in Europe, returning to Japan in September 1938. Present installations in the new First Mutual Life Insurance Building consist of :

25	Type 11	Electric Key Punch
5	Type 12	Electric Duplicating Key Punch
23	Type 51	Mechanical Verifier
1	Type 551	Automatic Interpreter
2	Type 512	Comparing Reproducer
1	Type 80	Horizontal Sorter (Model 1)
1	Type 75	Counting Sorter
1	Type 75	Counting Sorter, equipped with Card Matching Device
1	Type 75	Counting Sorter, equipped with Multiple Column Selection Device
1	Type 516	Automatic Summary Punch
2	Type 285	Numerical Printer
1	Type 405	Alphabetic Printer, equipped with Type 921 Automatic Carriage
1	Type 601	Automatic Cross-footing Multiplier with Additional Cross-footing Device


As equipment for hygienic facilities, 22 pumps used for fire extinguishing, water supply and other purposes, in fourth basement

Auditorium and general assembly hall situated on the sixth storey, seating capacity 600 upholstered seats


One-man control switchboard apparatus for electrical and boiler systems, in fourth basement


A 200 kw. Laston generator coupled with diesel engine, emergency light and power source, capable of supplying 275 kv amperes of current

SUMMARY OF BUSINESS AT THE END OF AUGUST 31, 1938—(36TH PERIOD)

Amount of insurance in force (August 31, 1938)	Y2,626,000,000
(when compared with that of last period..	Y373,000,000 increase)
Amount of new contracts (August 31, 1938)	Y507,000,000
(when compared with that of last period..	Y62,000,000 increase)
Total assets (August 31, 1938)	Y410,000,000
(when compared with that of last period..	Y62,000,000 increase)
Premium income (from September 1, 1937 to August 31, 1938) ..	Y91,000,000
(when compared with that of last period..	Y11,000,000 increase)
Interest income (from September 1, 1937 to August 31, 1938) ..	Y19,600,000
(The percentage against the average assets is 5.3%)	

(Continued on page 192)

Gold in Malayan Alluvial Tin

(The Mining Magazine)

In *Bulletin* No. 39 of the Dredging Association of Southern Malaya, P. B. Marriott discusses gold saving from alluvial tin ore in the F.M.S. He says that the paper is in no way intended to cover the whole subject, but is merely a description of a simple and successful method that costs very little and does not interfere with normal tin-ore dressing. No doubt, he says, there are gold losses, but these are so small and the time and expense involved in more elaborate methods so great that they cannot, without interfering with normal tin-ore dressing, be adopted.

The gold to be met with in certain alluvial deposits in Selangor, F.M.S., varies considerably in size, but, generally speaking, it is of a very coarse quality and the bulk is easily caught in chutes and on amalgam plates. The shape is usually flat with rounded edges and coarse grains up to ½-in. long by ⅛-in. broad and 1/16-in. thick are quite common, with some isolated specimens very much bigger, but by far the greatest proportion is the size of small pinheads, or, say, about 120 mesh I.M.M. The occurrence of the gold varies also, as would be expected in an alluvial deposit and it has been noticed that where sulphide ores such as arsenical pyrite and iron pyrite are present in abundance, the gold output has been very much higher. Over a period of nearly four years in which the writer has been treating dredge tin-ore concentrates for gold the average value per picul of concentrate, running about 45 per cent tin ore, is 0.09 dwt. per picul, or 1.5 dwt. per ton—i.e., roughly 10s. per ton at the present price. In spite of this low value, the gold is well worth while separating.

Treatment

Two factors, the author says, limit the method of treatment adopted. First, the gold content obviously cannot support an expensive treatment and, secondly, it must not hold up the normal operation of tin-ore dressing—that is to say, the dredge concentrate each day must be treated for gold and the concentrate handed over to the ore dresser by the next day at latest.

Experiments were first carried out with various slopes and different kinds of riffles in narrow launders and from the outset it was quickly realized that owing to the presence of the heavy tin ore, too much baffling would have the effect of blinding and the gold would not reach the bottom of the launder. It was found, further, that if mercury traps were installed, the amount of water required to keep these clear would have the effect also of carrying the gold over the end of even the longest chute and also be apt to carry away the mercury. Finally a gold launder was built to the following specification :—

The launder was made out of standard 12-in. meranti planks giving slightly under 12-in. in width after planing. The slope was 1 in 12 and the length of the chute—so as to ensure that none but the finest gold should get away—was 60-ft. The feed was lifted by a small bucket elevator, which was loaded by hand from the ore-bin at a rate of about 35 catties per minute. A small pump provided necessary water which was so regulated as to be just sufficient to make the tin ore travel down the chute and not blind. This quantity was found to be about 60 gallons per minute, or approximately a proportion of solids to water by volume of 1 to 50. On the inside of the chute was laid a strip of blanket crepe rubber. Overlying this was laid the best quality green baize cloth in strips of 6-ft. and, finally, ¾-in. expanded metal called " lathings " was placed and held tightly by wooden clamps at the sides and occasional tacks elsewhere where there was any tendency for the metal to belly. At a later date it was found that cheap flannel was equally good, but, price for life, there is not very much in it.

This launder was found to trap the gold very satisfactorily when not more than about 20 piculs per hour were passed over it. The speed of feed was regulated by the number of small steel buckets attached to a belt which travelled at an even speed. Power for the elevator and pump was provided by 5-h.p. motor. Eventually, while four dredges were running in 1937, there were three such chutes running in the tin-ore dressing-shed and the feed of ore and water was split up evenly by means of baffles in the head chute.

Ore from the dredges was unloaded into separate concrete bins for each dredge and put over the chute in turn. One coolie manipulated the feed with occasional help from a second who dug the ore to within his reach as he sat at the base of the elevator. This second coolie also watched that the distribution to the launder of ore and water was correctly maintained. Two others loaded tip wagons from the sump at the end of the chute and supplied the gold-free ore to the ore dressers according to which dredge was concerned.

The reason prompting the selection of so narrow a chute was that with a greater width it was thought that the ore was more likely to settle on one side or the other and blind the lathings, while the water would concentrate down the center. Also it was noticed that eddying, or the formation of small waves of water down the chute, were more easily set up with the wider chute.

It will also be noticed that amalgam plates were not at first installed. Recently, however, experiments have shown that a certain amount of fine gold was escaping and a plate has been placed at a flatter angle than the grade of the chute at about the 45-ft. mark and a small quantity of gold is now being amalgamated here successfully. The plates used are copper sheets about 16-in. long by 3/16-in. thick. The plate is first rubbed down with dilute nitric acid and mercury rubbed on. The amount required is about 1½ oz. per square foot. To help the mercury adhere it is usual to treat it beforehand also with nitric acid, forming a small amount of nitrate of mercury. A freshly amalgamated plate may become coated with a green slime of subsalts of copper ; this coating must be carefully scraped off and the plate rubbed over with fresh mercury. To remove the gold amalgam from the plates they may be scraped with a knife or a stiff short-bristled brush and then more mercury rubbed on to take its place. This should be carried out every day or losses may result.

Wash-ups are carried out bi-monthly as follows :—

First thing in the morning the three chutes are streamed down with a gentle flow of water until the expanded metal is entirely free from all blinding and the gold can be seen adhering to the flannel. The water is then stopped, the clamps, tacks, and lathings removed and the flannel, or green baize, rolled up from the bottom of the chute a section at a time. These are then thoroughly cleansed in a tank of water, each length having been examined for oversize nuggets which can be hand picked and these are kept on one side for adding to the final smelting charge.

Amalgamation

The concentrate so obtained—consisting of tin ore, pyrite, a little amang and sand, as well as the gold—is then put into an amalgam barrel or drum. About 4-lb. of mercury are put into the barrel with approximately a " tong " of concentrate and the barrel then almost filled with water. The barrel is turned slowly for about three hours, by which time all gold has been amalgamated. The amalgam is then drawn off together with the surplus mercury and the remaining concentrate is put back over the chute. The amalgam and free mercury are then squeezed through a clean chamois leather and a round ball of amalgam, consisting of approximately 60 per cent Hg and 40 per cent Au is obtained, which is then retorted.

When, says the author, an amalgam barrel was first experimented with, it was found that the gold was of low assay and was so brittle that the usual cheap Chinese method of assaying by touch stone could not be applied and a chemical assay costing $2.50 had to be resorted to. Eventually it was found that if the process of amalgamation in the barrel was too prolonged or the agitation of the concentrate too severe, a certain amount of the impurities in the concentrate also became amalgamated, principally arsenic and sulphur, which hardened the gold, giving it a lighter color and covering it with small hair cracks. The process has therefore been cut down to not more than three hours and the remaining concentrate is then put back over the chute.

(Continued on page 192)

America's First Foreign Trade Zone

By Dr. JACQUES C. MAGUITE

THERE is perhaps no truer adage than that which says—" The only thing permanent is change " and this old saying is undoubtedly more applicable to that international industry called " Foreign Trade " than any other. Trade relations have been carried on from time immemorial, but its shifting position, the character of goods, the methods of transfer and transaction are forever changing as time passes and in accordance with the economic and sociological factors that effect their pressure upon the lives of the World's inhabitants.

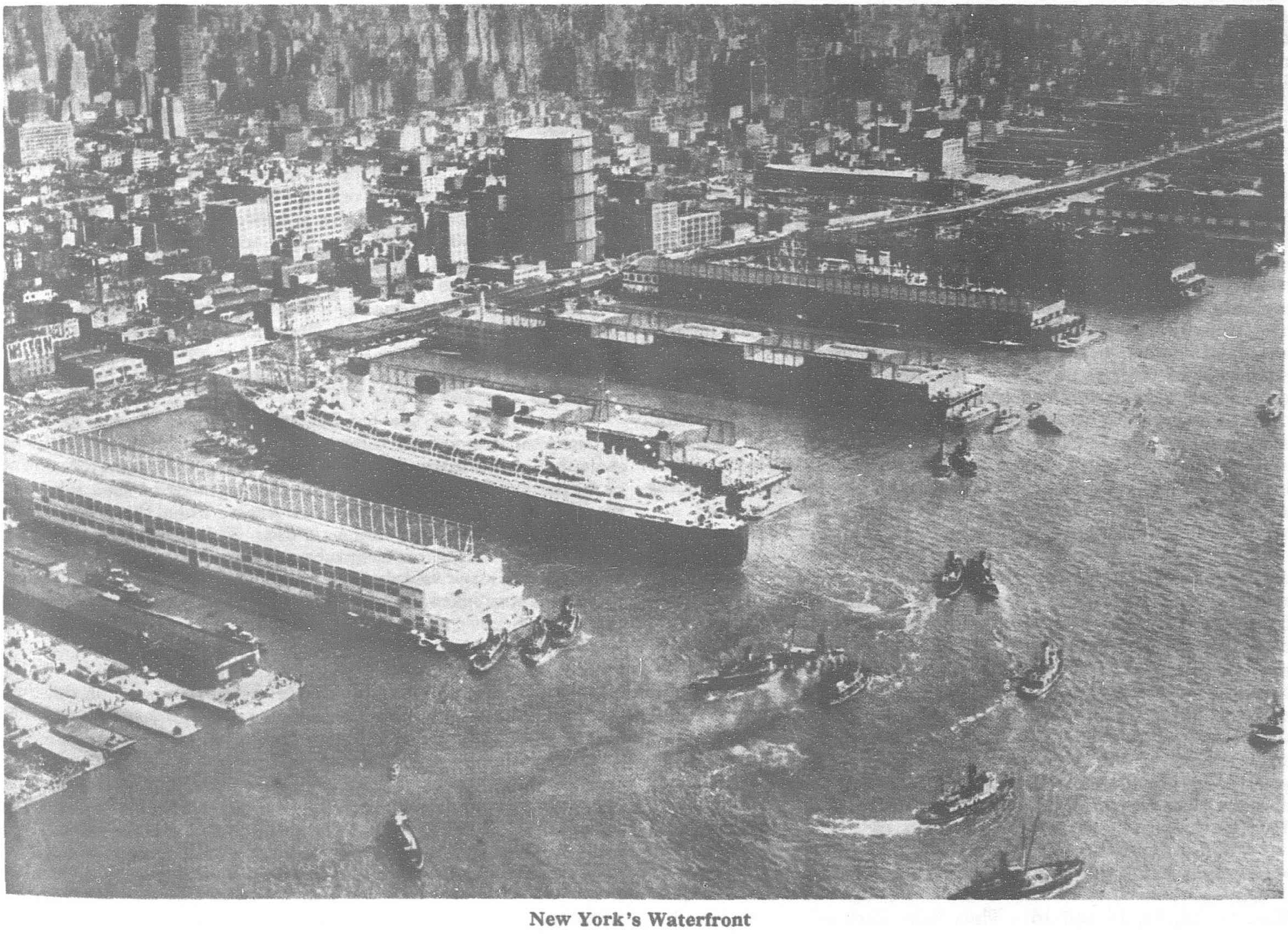
Definite and specific steps in this process of change can be traced through each succeeding generation, and the super-liners of to-day will probably within another twenty-five years be antedated or as obsolete as their predecessors that ruled the waves in speed and capacity in earlier eras. Our memory of their serenity in their day is all that is left of these former monarchs of the sea. Even the nomenclature of the sea has changed, and the glossary of the famous clipper sailing ships now belong to the limbo of the ages. This famous name, as we all know, is now applied to ocean-going seaplanes, which have effected even greater accomplishments in speed than did its predecessors of the century past. Days in transit are reduced now to hours, making neighbors of once distant lands.

In foreign trade, the character of goods, both in volume and quality, follow those routes offering the greatest advantages in time in transit, cost of transportation and storage. Naturally, those ports offering the most in these factors are ensured the largest portion of the Nation's trade. From this unequal distribution grows rivalry and keen competition, with the consequent success and expansion for the winner ; and for the loser, loss of investment, deterioration and unemployment. In varying degrees and velocity, this process of economic evolution has been going on among our Nation's many ports,—is now going on before our very eyes, whether on the Atlantic, Pacific or Gulf seaboards, slow and unnoticed as perhaps it seems.

Out of the Middle Ages

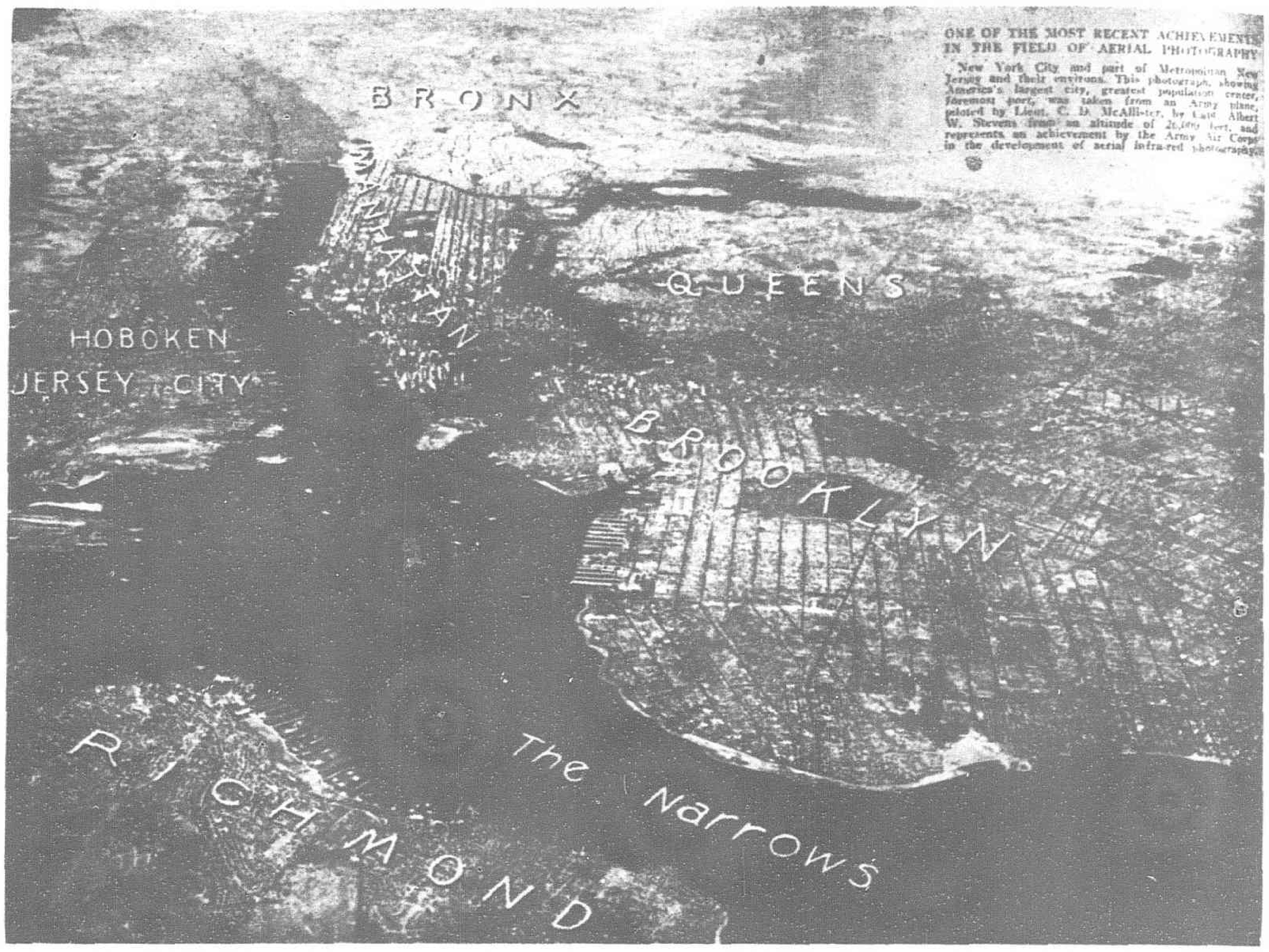
The fluctuation becomes more apparent when cold facts are presented as concrete evidence. Like many " new " ideas tending to the improvement of economic conditions in a given civilization, there is nothing intrinsically new in the notion of foreign-trade zones. They are designed to-day, as they were under the Hanseatic League, to stimulate and encourage commerce. The foreign-trade zones of to-day, as the free ports of Europe for the past several centuries, serve as clearing-houses for international traffic, and provide a constant barometric gauge to the state of a nation's foreign business.

Under the Hanseatic League, and generally during the Middle Ages, flowering period of the Free Port idea, the cities dedicated to such functions often wielded great political power. The purely autonomous cities—Venice, Genoa and Bruges are examples—linked this political power, gained through control of trade routes, to civic prosperity and advancement in the arts and sciences. These great free towns provided a bridge over which the Middle Ages



New York's Waterfront

passed to the modern period. Their names—Hamburg, Bremen, Leipzig, Cologne, Antwerp and Amsterdam—remain to-day as symbols of that emergence from the feudal domesne to the modern state, with its centralized political and fiscal control. Hamburg is to-day the greatest of these free ports, its greatness conferred by its strategic position. The change in sea-routes has in most cases brought about a decline in the importance of the old free cities, while creating still others in their stead.



ONE OF THE MOST RECENT ACHIEVEMENTS IN THE FIELD OF AERIAL PHOTOGRAPHY

New York City and part of Metropolitan New Jersey and their environs. This photograph, showing America's largest city, greatest population center, foremost port, was taken from an Army plane, piloted by Lieut. C. D. McAllister, by Capt. Albert W. Stevens from an altitude of [illegible] feet, and represents an achievement by the Army Air Corps in the development of aerial infra-red photography.

The Port of New York, one of the largest protected harbors in the world comprises a number of bays, rivers and connecting waterways with direct water frontage of 771 miles. The principal entrance from the Atlantic is by way of the Ambrose Channel traversing the lower bay to the Narrows

The nations following the World War, recognized the need for such zones, adapted to the exigencies of modern commerce. The War played havoc with normal outlets, and depressed the financial level to a point where a foreign importer hardly dared risk paying duty on goods the eventual sale of which seemed dubious. In addition, protective barriers were being erected everywhere in a mad scramble to ensure economic self-sufficiency among the various nations.

In this modern industrial era, trade is no longer a simple process in which the rule of give and take carries the day. Simple exchange of foodstuffs and raw materials is rarely carried on nowadays, because foodstuffs are not often simple when they reach a foreign port, nor are materials raw in the true sense. Almost always some handling must be undertaken before the commodity is ready for its ultimate market. This handling may be a matter of processing, blending, or simple grading, but it must be undergone; and only rarely may it be done feasibly at the port of export, since the infusion of domestic materials or grading to the standard of the country of import must be taken into account. In many cases, too, goods are shipped not on consignment to a definite buyer, but on speculation to possible buyers. Such goods must be re-marked for shipment once their sale has been consummated at the port of entry.

The principle of tariff protection, following the War, seems well on its way to permanent establishment. The depression which followed showed the nations that internal self-sufficiency is no longer an easily attained goal. It is essential, of course, that the domestic manufacturer be protected in some measure from ruinous competition, but he may be as definitely ruined by loss of foreign markets as by non-protection from manufacturers abroad.

Thus foreign-trade zones became an obvious necessity for the health of commerce among nations. Hamburg and Danzig were reaffirmed in their free status. The British Empire had already gone through an era in which practically every Empire port was open to free trading with every other, and a return to that status, under some method of free-trade zone operation, became again an immediate probability. Within the past year the Canadian Parliament has considered the assignment of certain home ports as such zones.

American View Points

This definition had provided a basis for consideration of such zones, and has been often referred to in discussion on the question. In the case of the United States, almost all discussions have laid insistence on two additional stipulations. In effect, while goods might be laid down without duty in such zones, pending processing, handling or transhipment, they become immediately subject to customs duties, tariffs and other normal taxes when they were shipped out of that zone into domestic territory. These conditions are explicit in the present law. Foreign trade zones became possible in the United States with passage by the 73rd Congress of the Celler Foreign-Trade Zones Act (Public No. 397) in June, 1934.

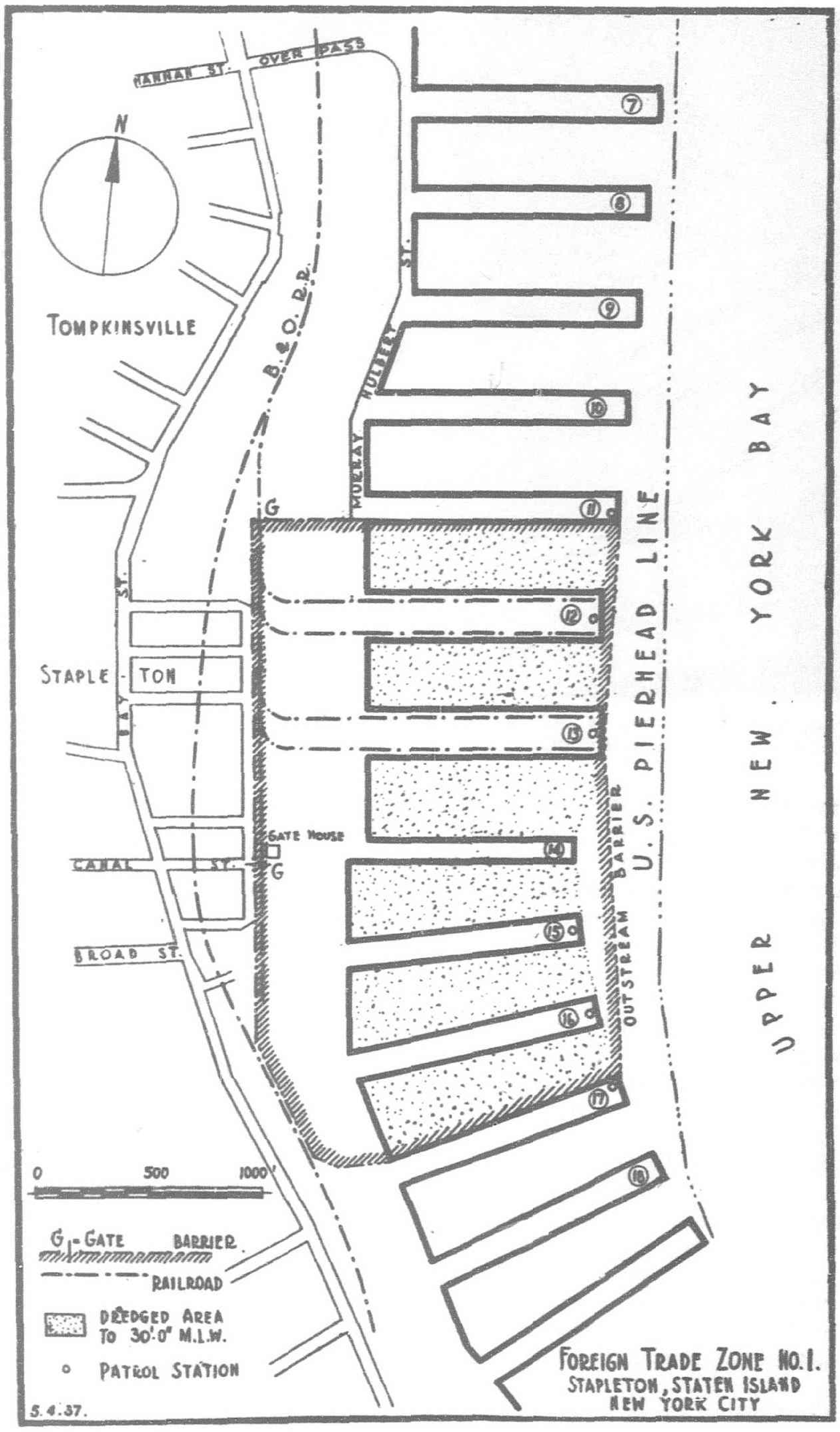
Foreign Trade Zone No. 1, located at Stapleton, Staten Island, was opened on February 1, 1937. It is operated by the Department of Docks, of the City of New York and comprises municipal piers Nos. 12, 13, 14, 15 and 16. Thus New York joined the long list of world cities with foreign trade zone facilities. The zone may be described as an isolated area, under the supervision of the Collector of Customs for the Port of New York, having every possibility for dockage and unloading, and where foreign goods may be stored pending sale or reshipment, without payment of customs fees. The Zone is operated as public utility by a corporation (the City of New York, and later by a contractor-manager under special agreement with the City Administration), but supervision of customs duty collections is under the Customs Service.

The issuing of permits for the establishment of a Foreign-Trade Zone to the ports of New York and Mobile, Alabama, and the contemplated granting of other permits to a number of ports on the Atlantic and Pacific Coast, have met with considerable opposition from certain groups of bonded warehousemen who fear that the Zones will compete with their industry. Whether such fears are well founded or not can best be determined by reviewing the existing operations of bonded warehouses on the one hand, and of the Zones on the other.

Bonded Storage Warehouses

The purpose of the bonded storage warehouses is to relieve importers of the necessity for paying duty on foreign goods which in unchanged form are destined for re-shipment to a foreign country, or to permit the postponement of the payment of such duty until the time, within a period of three years, when the owner desires to remove the goods for domestic use. This arrangement does not expedite the entry or clearance of shipping, nor the handling of the goods, since vessels must submit to the same formalities and requirements regardless of whether their cargoes are to be placed in bond or not; and the goods must be sampled, weighed and tested, whatever their destination may be, before removal from the dock.

The delays incident to the proper assessment of duties on imports result largely from the carrying out of rules and regulations which have been made, for the protection of public revenue, to prevent unauthorized entry of foreign goods into the domestic market. The owner of goods to be placed in a bonded storage warehouse is required to give bond for double the amount of the duty, which is forfeited if the goods are stolen, lost, destroyed or removed without payment of the duty. Drayage between dock and warehouse must be under bond, and from the time the goods enter port they are under constant customs control and supervision until they are re-shipped or the duty has been paid.



While in the warehouse the goods must be placed in accordance with certain well-defined regulations, so that they may at any time be checked and inspected by agents of the Treasury Department. Permits must be obtained for their reception and delivery, and strict accounts must be kept of all warehouse transactions.

Except during usual business hours, the warehouse is closed by a Government lock; to enter it at any other time requires special permission and necessitates payment for the overtime presence of a customs agent. Breaking bulk and the opening of original packages are prohibited except where serious damage is threatened, in which case the work is performed only by special permission and under the supervision of customs employees.

Subject to these regulations, the expense of which is made a charge upon the goods, an owner may leave his merchandise in bond for any period up to three years, and at the expiration of that time the duty and charges must be paid and the goods removed or they will be considered as "abandoned to the Government" and sold.

The regulations against breaking bulk and opening original packages, of course, prevent the owner from sending part of his goods to the domestic market and reshipping part to a foreign country. The bonded storage warehouse, therefore, is prevented from furnishing the necessary facilities for transhipping, and this business is now carried on mostly in ports of the North Sea and in Asia at Hongkong and Singapore.

The usefulness of the bonded warehouse is sometimes further restricted by the tariff practice of the country to which the goods are re-shipped. For example, under the laws of Canada goods which have been held in American bonded warehouses have been treated exactly as though they had entered American domestic market or commerce, and have been assessed for duty at the foreign value plus the amount of duty which would have been paid on them if they had actually been first cleared for consumption in the United States.

Bonded Manufacturing Warehouses

Even more stringent are those applying to the bonded manufacturing warehouse. In the latter institution, foreign materials may be entered free of duty and worked up into manufactures ready for consumption.

(*a*) Production can be carried on in such a warehouse for export only. With a few special exceptions, the output cannot be disposed of in the domestic market, even on payment of duty. The most important exceptions are metal from ore smelted in bond, and cigars "made in whole from tobacco imported from one country." Minor exceptions are found in a provision for the entry of Mexican peas, or garbanzo, which have been cleaned at such a warehouse, and in the permission to sell for domestic consumption, by-products and waste arising in the manufacture of goods for export, provided duty is first paid on such articles as if imported from abroad.

(*b*) Before beginning operations, the proprietor must file with the Treasury Department and with the collector of customs, a statement of all the articles he intends to manufacture, giving the names of the articles, the exact kind and quantity of ingredients, and the formula of manufacture, and he must adhere rigidly to the formula set forth.

(*c*) He must also give bond in double the value of the duty he intends to produce.

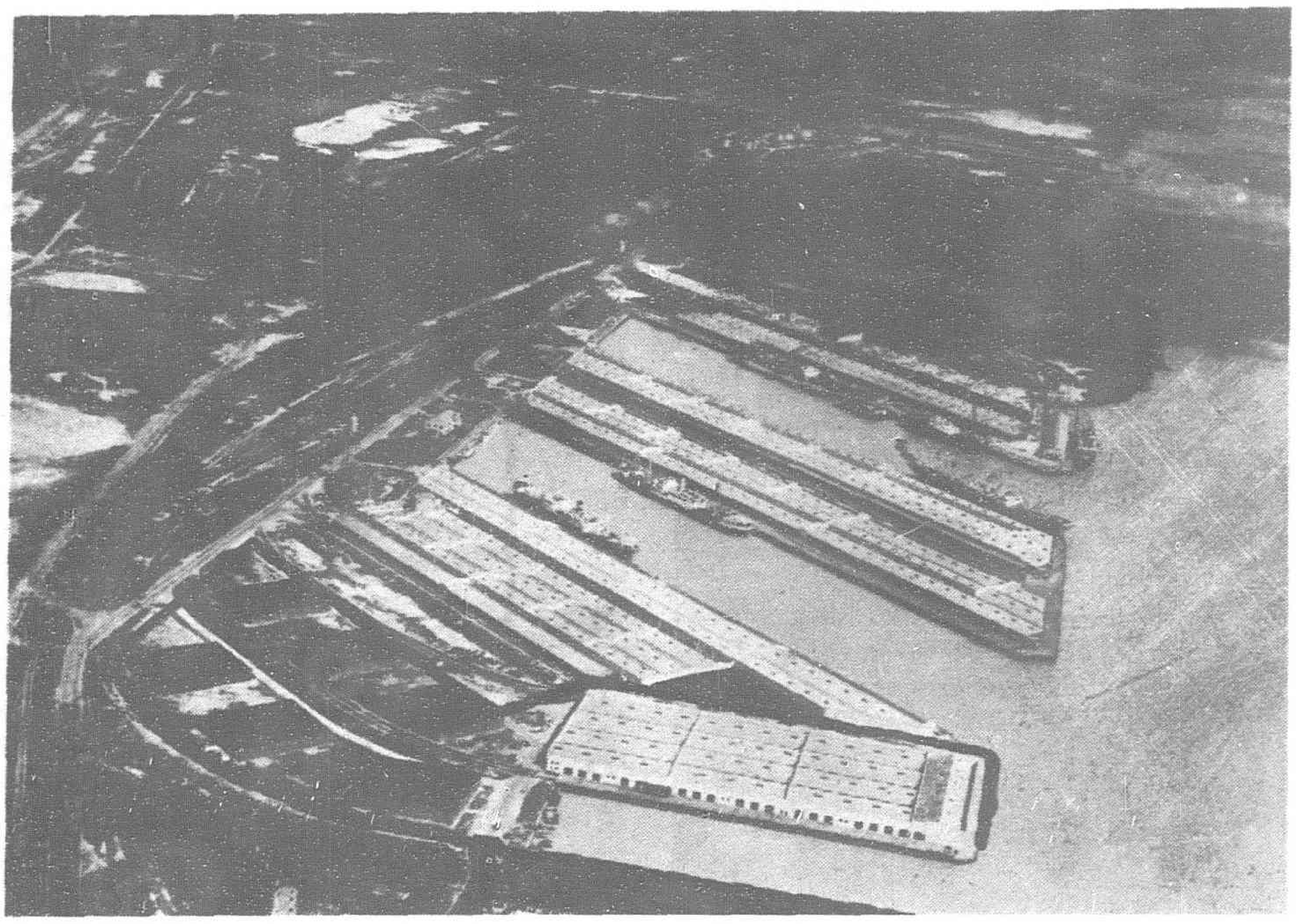
(*d*) From beginning to end materials and operations are under strict customs supervision. A multitude of restrictions make the procedure intricate and expensive, and the penalties for violation are very heavy. Only in the most highly standardized industries is it possible to avoid frequent disputes and misunderstandings.

Concerning goods in bond, it must be borne in mind that the bond, or twice the value of the duty which the importer must give, aids no one, not even the Government, but instead, is withdrawn from the working capital of business. When it is considered that goods in the bonded warehouses of New York sometimes are assessed at from $90,000,000 to $120,000,000 in a single month, and that the merchants handling these goods, withdraw from their working capital $180,000,000 to $240,0000,000 it is seen that this is a drag on our foreign commercial transactions of no small consequence. Instances such as these are designed to be entirely eliminated by use of the foreign trade zone.

With the regulations of bonded storage and bonded manufacturing warehouses in mind, it appears obvious that the foreign trade zone, or free port, will serve in a contigent capacity, and not be competitive. The permission to tranship and re-export trade has existed in the United States for many years. The fact that this type of business has dwindled during recent years, is evidence that additional facilities, or rather new ways and means are necessary, if this type of trade is to be brought back to our ports, and increased to respectable proportions, so as to round out our general foreign trade picture.

Drawback

The law authorizing what is known as drawback, permits an importer, instead of placing his goods in bond, to pay duty on their entry and then to drawback from the Treasury on their re-exportation 99 per cent of the amount paid. This provision, of course, cannot anymore than the bonded warehouse relieve commerce from the delay and other burdens incidental to customs enforcement. The intent of the law is to aid production for foreign



Site of the proposed Foreign Trade Zone of the City of Mobile, Alabama. Boundaries of the Zone are outlined in dark shaded portion of the picture

markets by relieving from customs duties, imported materials that are manufactured or finished in this country and then shipped abroad. But the relief thus afforded, except in the sugar and tin-plate industries, has been relatively small. The reason is that, for the prevention of fraud, the privilege is so hedged about, with exacting and intricate regulations that the amount of the drawback very often does not pay for the labor and cost of collecting it. The following is the gist of these regulations :

(*a*) To prove the identity of goods on which drawback is claimed requires a minute checking of imported elements entering into the manufacture, with the right to and oftentimes threatening the disclosure of trade secrets of importance. So complicated is the procedure in making claim and proving identity that many producers do not find it worth while to apply for drawback at all. Large-scale industries, such as sugar refineries and those compelling the use of large quantities of tin plate, go to the expense of employing experts permanently to look after their drawback interests.

(*b*) Every step taken is subject to customs inspection, and oaths are required from importers, superintendents, and exporters.

(*c*) Even after reshipment, before drawback can be recovered, evidence must be given of the actual landing of the goods in a foreign country.

(*d*) At best, under the smoothest operation of the law, that part of the owner's capital advanced in payment of duties is tied up thirty days after they are reshipped.

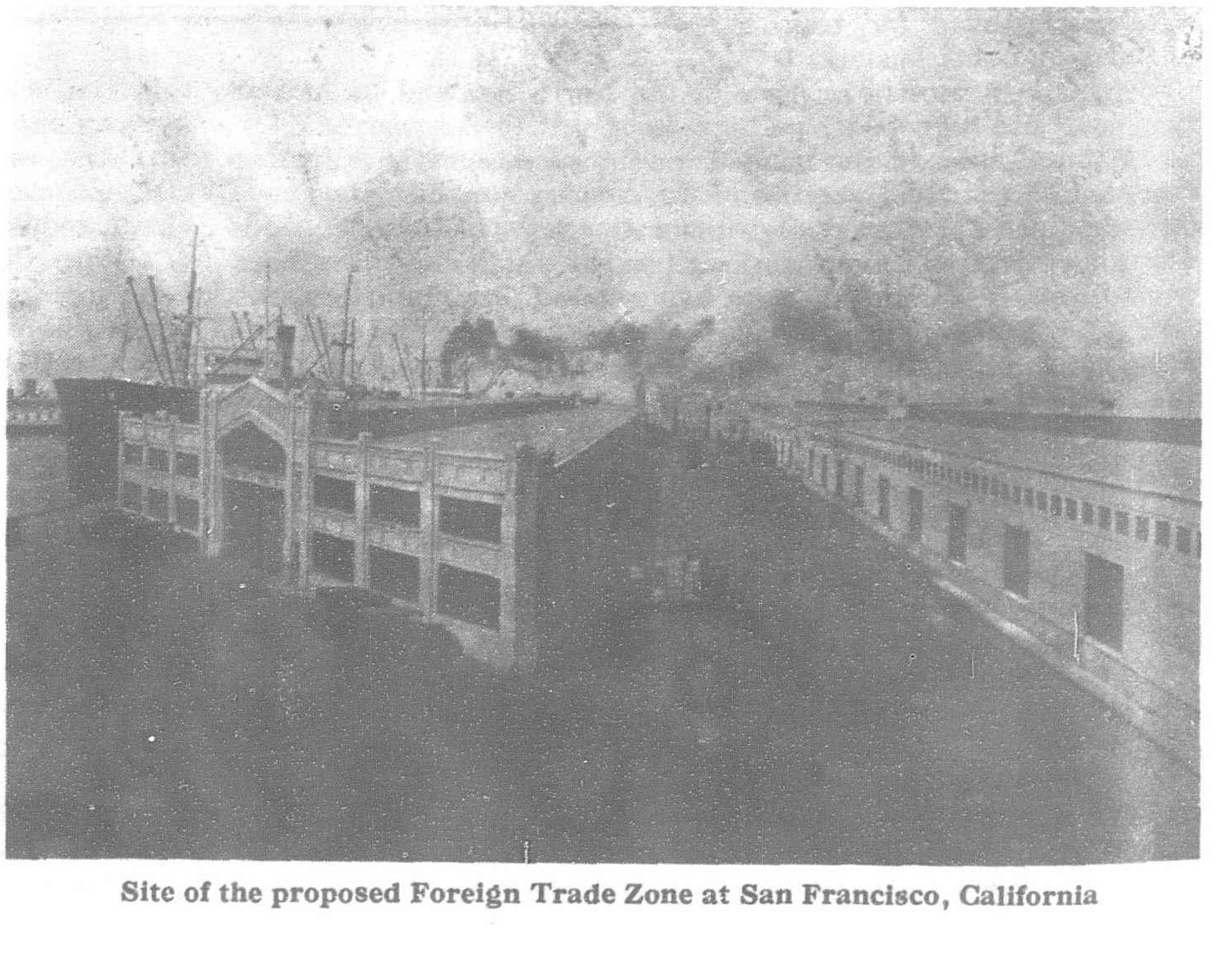
The Foreign Trade Zone

The most important prerequisite is that a Foreign Trade Zone shall provide properly coordinated modern and efficient physical facilities for the lading and unlading of cargoes, the entry and clearance of vessels, and the handling of merchandise. In the main, wharves, docks, piers, terminal facilities, and other necessary features of American ports have developed with few exceptions by a process of planless accretion. They are exposed to frequent fluctuations between slack periods and congestion, and recent experience has proven them altogether unprepared for emergency. The uncertainties of business discouraged the installation of costly modern equipment, and this in turn, increases the direct labor charge and adds to the expenses of trade. The privileges of a free zone, through the promotion of commerce in regions naturally adapted for it, would attract capital to the creation of facilities that should in every case be made an indispensable prerequisite.

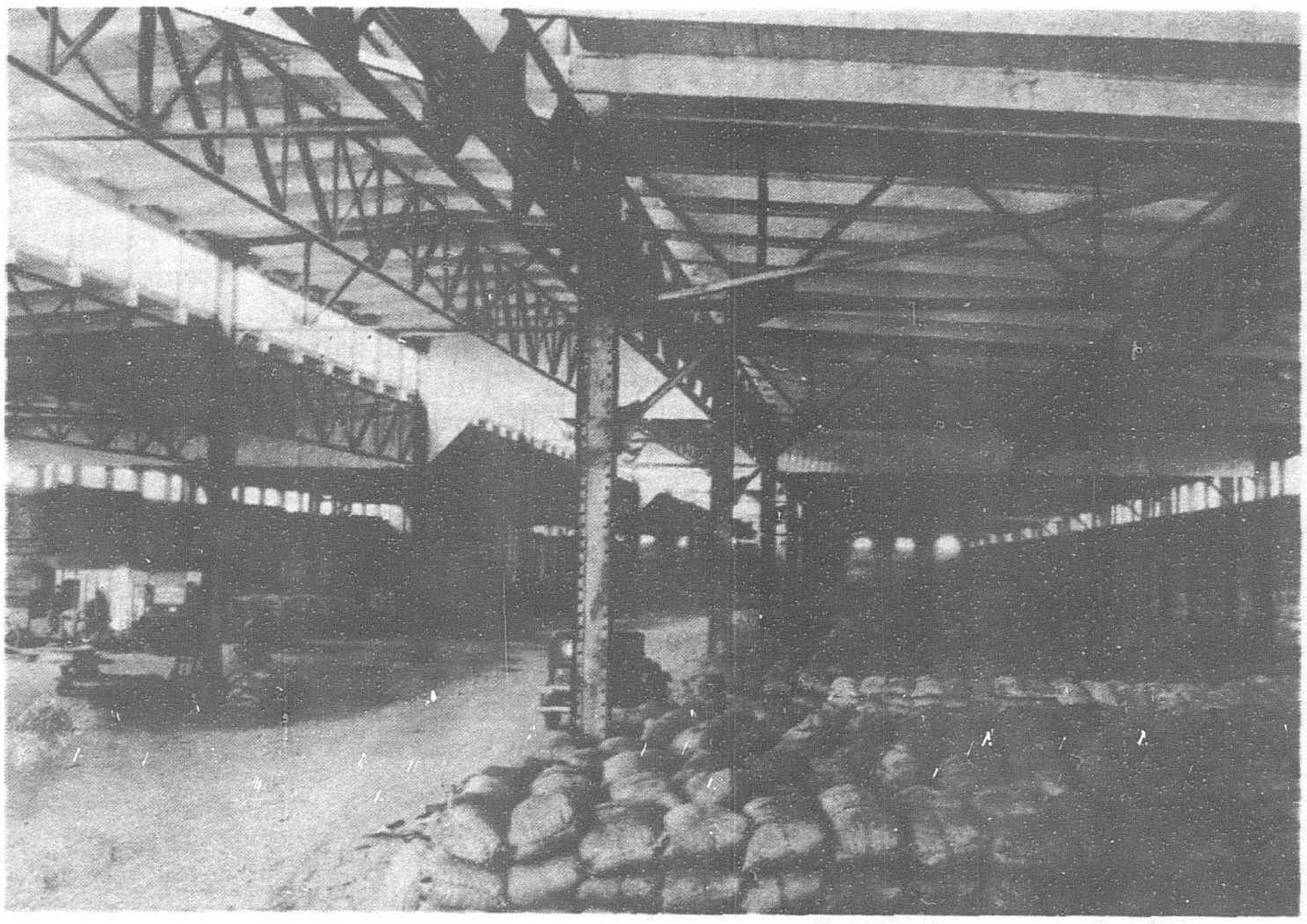
The subject of providing new facilities cannot be dismissed without reference to its probable effect on facilities already existing and the investments that have been made in them. The prospect that a publicly financed free zone with its elaborate equipment would destroy the usefulness of the facilities already constructed at great cost in our ports has brought forth a widespread and unjustified opposition to its establishment and operation. The trade, for example, in the free port of Copenhagen grew in seven years by 400 per cent, while at the same time the trade of the old, or customs, port not only escaped a loss, but actually showed some gain. The purpose of a free port is not to divert business from those who now transact it, but to provide for new business that under present circumstances cannot grow as it might.

Undoubtedly the most prominent example of a successful free port is that of Hamburg in a country flourishing with manufacturing industries and possessing a strongly protective tariff. The question of home interests according to its history, were almost parallel to those that now arise in the United States, was met with thought for the general good of the nation, with the consequent result, that the Free Port is one of its most popular and important institutions. Other nations have likewise manifest interest in free ports. Norway and Sweden have established free ports as Malmo and Stockholm respectively, and operation, although only a few years in existence, has met with highly satisfactory results.

Perhaps no greater rise in maritime prominence has been made in modern times than the new free port at Gdynia, Poland. Trieste, on the Adriatic Sea, has likewise shown extraordinary growth, due largely to the activity of the free zone within its port. The free port of Copenhagen has not gained success in the same degree attained by several other of the prominent Northern European ports. This is attributed by many, to be due to the fact that competition within too close a proximity has retarded its activity, while others attribute its lack of growth to the fact that manufacturing is not permitted. It must be borne in mind, however, that European free ports were built up slowly in conjunction with the gradual demands of trade, while American activity is aimed at recovery of lost trade as swiftly as possible. From this evidence, it will be clear that free ports have been found practical in countries possessing high tariffs, and highly diversified and organized manufacturing industry. Critics may point immediately to the difference of



Site of the proposed Foreign Trade Zone at San Francisco, California political and geographical conditions that prevail in many of the countries in which free ports prevail, as against those found along Atlantic, Gulf and Pacific seaboards. They fail to realize, however, that our frequency of sailing as manifest by the sailing schedules of our prominent ports and our proximity to Central and South America, provides potentialities that may permit our free ports to duplicate the successful performance of many of our European predecessors.


Inside view of a pier of the proposed Foreign Trade Zone at San Francisco

Potential Business of a Foreign Trade Zone

The operations of a Foreign Trade Zone consist of receiving and manipulating foreign products and reshipping them in the direction and at the time to take advantage of the best foreign markets. This is not only a profitable business, it is also becoming a necessary business to our industrial growth. For however wide the range of goods we produce and however effective our methods of production, we can sell our products to best advantage only when the purchasers are able to pay for them with products of their own. If we do not accept their products, they must sell them in some third country and transfer to us the credit they thus acquire—unless, indeed, they forego buying our goods at all and make their purchases in the country where they make their sales. The advantages to be expected from a free zone system may be summarized under the following heads:

(1) In simplifying entry and clearance;
(2) In equalizing inbound and outbound traffic;
(3) In facilitating dealing in foreign products;
(4) In stabilizing transhipment trade under varying tariff policies;
(5) Creating new ways and means of increasing our foreign trade to enable American industry and traders to compete more favorably in World markets.

The Celler or Enabling Act provides for the establishment of a Free Port or Foreign Trade Zone in any port of entry where definite advantage can be shown by its establishment. Its area is considered as a neutral zone entirely apart from customs territory, where foreign merchandise can be entered and treated with comparatively no customs restrictions or expense. Such goods can be examined, repacked, sorted, graded, assembled, re-bottled and re-exported, so long as the process involved can be termed "manipulation" or "processing," but no manufacturing. Manufacturing and exhibitions are not permitted. Prospective customers, however, may examine whatever specific merchandise in which they manifest interest. Domestic merchandise may be mixed with imported goods, without customs supervision, other than the requirement of statistical records.

Foreign Trade Zones have definitely been created to increase our export trade, since there are sufficient facilities already provided to accommodate our imports. Thus Foreign Trade Zones are aimed not to disrupt the present industrial order of the nation, but to widen its scope, by finding new and permanent outlets for our surpluses. This evolutionary measure should likewise contribute additional stability to our trade, reduce seasonal fluctuations of production, and thereby aid our general economic life.

Since the passage of the Celler Act, many have thought Foreign Trade Zones could become more effective if manufacturing were permitted, such as in the great port of Hamburg. It is only logical, however, that our venture in free ports should first prove its effectiveness by the use of the facilities it now permits. Should manufacturing be essential to adequately round out its usefulness, it is believed such permission will be forthcoming. Industry throughout the nation can then be even more widely served.

Such are the advantages, concisely stated, that may accrue from the establishment of a free-zone system. They are necessarily contingent, for the reasons that are found in a kind of commerce which for several generations has existed in the United States in relatively insignificant amount. It is evident that the success of a free zone and all the claims that are made for it will depend on two things, namely, the volume and character of its commerce and the efficiency of its construction and operation. This explains why the results of European experience have differed in different ports. Obviously, the free zone alone cannot create commerce; it can only facilitate the operation of the forces that do create it.

At the present time, the commerce proper to a free zone exists in relatively small volume at the ports of the United States; and since investments for constructions and equipment would have to be made with a view to its future growth, they would be in a large measure speculative. But many of the conditions formerly limiting American participation in international trade no longer exist, and within the last few years the joint influence of new forces has given to our commerce an expansion that has taxed our port and harbor facilities even beyond their capacity. Active measures for the retention of this commerce after the period of last depression will be necessary; at the same time, its present importance and the possibility of its further development underline the confidence of those who advocate a system of free zones.

The zone, being a segregated and enclosed area of land and adjoining water sufficiently large to accommodate present foreign commerce, should possess the possibilities for growth by additions when needed, and amply equipped with all the necessary wharves, warehouses, railway terminals and switching facilities and mechanical devices for the rapid and economical handling of cargoes. Under the bonded warehouse system you are not permitted to break packages, to break bulk, and to bring some of them into the interior and re-export others of them as the opportunity affords, where it is possible to sell them. But in this large area where you would have open spaces and non-bonded warehouses, and where the fence, the enclosure, with the guards outside, would fulfil to greater perfection the purposes of the bond, in this large area with plenty of room to do the work of foreign commerce, we could also do them advantageously. The bonded warehouse does not and cannot be made to afford the necessary facilities for doing transhipping business.

New York Foreign Trade Zone

The physical plant at Stapleton, Staten Island, being utilized for the zone provides facilities for almost every type of permissible operation. Four of the five piers are of double-deck construction floored with concrete and with wooden sub-decks. Pier sheds are of steel. Pier 12 and 13 are approximately 1,000 feet in length and slightly over 200 feet wide. Tracks on either side of each pier connect directly with the trackage of the Baltimore and Ohio Railroad system, and provide direct shipside loading and unloading facilities as well as immediate transhipment services to any part of the country. Those piers are each equipped with 12 semi-portable revolving electric gantry cranes and five electric combination cranes, each with revolving and straight line units. Both upper and lower decks of the two piers have a clear height of somewhat over 24 feet.

Piers 15 and 16 are also double-decked, the former being 1,050 and the latter 1,100 feet in length. Each is 150 feet wide and has a clear height of more than 16 feet on each deck. Both have cargo beams for the rigging of ship's tackle. The four piers offer a total of 300,000 square feet of enclosed floor area and 6,500,000 cubic feet of capacity, with facilities for storage and transit of about 80,000 tons of cargo. Provision, according to demand, will be made for heated space. Pier 14 is particularly suited to the berthing of tugs, lighters and other service vessels. This is an open deck pier, floored with concrete and of wood pile sub-deck construction.

A total of 20,000 square feet of office type space is also available in the zone, divided into rooms of various sizes. This space is available for most ordinary manipulations of goods, such as sorting, grading and re-marking. Additional facilities for handling specialized types of goods, as well as quarters and equipment for manipulating operations, will be added to the zone from time to time. In this connection, to provide zone authorities with a gauge of probable requirements, inquiries and suggestions from users are invited.

Permissible Operations

Permissible operations within the zone, for which facilities are now provided or contemplated, are as follows:

Storage in pier sheds.
Storage and/or manipulations in locked rooms of various sizes.
Storage on open deck pier with minimum handling.
Ground storage of products in drums and barrels.
Breaking up bales, boxes, crates, barrels, drums, bags.
Repacking all types of merchandise including mixed shipments and assortments of foreign and domestic goods, bottling, canning, etc.
Assembling containers and various types of equipment and merchandise as permitted by the Collector of Customs.
Marking or re-marking country of origin or otherwise marking or labeling all types of foreign and domestic merchandise.
Distributing all types of merchandise to foreign and domestic consignees.
Sorting hides, skins and various types of merchandise.
Grading all types of raw and manufactured products.
Cleaning of crude drugs, rice and other grains and any processing of drug and food products that may be permitted by the Collector of Customs.
Mixing with foreign or domestic merchandise, or otherwise manipulating merchandise as permitted by the Collector of Customs.
Inspecting and sampling merchandise by prospective buyers.
Bunkering vessels with coal or oil.
Providing American registry ships with foreign supplies (but not equipment) withdrawn from bonded warehouse.
Transhipment of foreign merchandise via other vessels or via bonded lighter, bonded truck or bonded railroad cars.
Receiving and shipping merchandise via "free lighterage" (railroad loading and unloading charges 2½ cent per hundred).
Berthing all types of vessels up to a draft of 30 feet.

While the most generally useful facilities are planned for the zone, it is from potential users that the most practicable suggestions will eventually come. For this reason inquiries or advice are welcomed by the zone administration.

Foreign Trade Zones for the next five years should at best be considered an experimental venture. Much will depend upon participation on the part of those interested in maritime trade. It should be firmly understood, however, by those unable or unwilling to avail themselves of foreign trade zone advantages, that this establishment will in no way jeopardize their present or future status, so far as the domestic market of the United States and her possessions are concerned. No unfair advantage in this regard can be gained by any participant over his competitor. No community or industrial center need look with doubt when considering the security and stability of their economic life, for foreign trade zones are designed to aid, not to hinder American industry. Foreign Trade Zones' influence can and will be extended to their very door through shipments in bond to inland shops and factories, and in this manner, wield even more widespread influence. It will, without question, be to the advantage of anyone who is concerned with duty payments large or small, uncertain stock supply of foreign goods, and all those engaged in trading, handling or manipulating goods of foreign origin, to investigate the possibility of establishing some activity within the Zone barrier.

Charges relevant to transportation, handling, bonding, customs formalities and drawback can be eliminated in many cases or in some instances be materially reduced through foreign trade zone activity. There is no minimum restrictions as to the amount of participation permissible.

It is believed that Foreign Trade Zone No. 1 on Staten Island, New York City, with its strategic location in the World's greatest port, and within a radius containing one of the Nation's largest manufacturing centers, will prove to be a notable guide for those zones yet to follow. Being so endowed, it possesses the most valuable asset to assure its success.

Tokyo Bids for World Leadership in Office Building Construction

(Continued from page 185)

Amount of death claims	Y25,400,000
Number of policy holders	750,000
(when compared with that of last period	99,000 increase)

The Executives of the Company are: Chairman of the Board and founder of the Company, Mr. Tsuneta Yano; President, Mr. Taizo Ishisaka; Director, Mr. Shintaro Ohashi; Director, Baron Ichizaemon Morimura; Director, Mr. Genzo Hattori; Director, Mr. Kenjiro Matsumoto; Director, Mr. Shigetaro Ishioka; Auditing Director, Mr. Toshikazu Suzuki; Auditing Director, Mr. Mantaro Ito and Auditing Director, Mr. Shigezo Imamura.

Gold in Malayan Alluvial Tin

(Continued from page 186)

COSTS.—Regarding the cost of the whole operation of extracting gold, the following list gives approximate details :—

Period	30 days.
Concentrates treated	8,880 piculs.
Gold extracted (unrefined)	32 oz. troy.
Cost (including depreciation on plant)	$175.00.

Finally, the author thinks it may be of interest to those who have not yet tested their tin ore for the possible presence of gold in sufficient quantities to warrant saving, to know in which districts mines are already successfully extracting it. They are as follows :— (1) Petaling—Kuchai valley; (2) Selayang—Kent district, and (3) Rawang district.

Hongkong Aircraft Factory

Plans for the establishment in Hongkong of an aircraft assembly factory, somewhere in the New Territories, are in an advanced state of preparation, the *Sunday Herald* learns from a trustworthy source.

It is understood that capital to the extent of five million dollars is available to the would-be promoters of the organization and that an application for a factory site has already been made to the Hongkong Government.

The attitude of the authorities towards the scheme has not yet been officially disclosed, but preliminaries in connection with the scheme are being proceeded with.

In this connection, it is learned that two of the principals are leaving on a tour of Britain and the United States in the near future, for the purpose of making arrangements for supplies of aero-engines and other essential materials.

Flood Prevention and Other Hydraulic Problems in China

(From The Engineer, September, 1938)

A CLOSE association with the people of China for nearly thirty years, and a lengthy study of their social and economic life, has convinced the writer that water control is the most important subject for research and for constructive work in that country. Whatever may be the political changes in the life of a nation of 450 million people, the struggle for food will continue. The production of food in China is almost entirely dependent upon irrigation and flood prevention. The hydraulic engineering works completed and projected, mainly with the object of increasing food supply, are of great historical and technical interest. A fascinating aspect of the subject is the fact that China offers unique opportunities for research work concerned with field hydraulics. Very much more information is required concerning the laws of silt transportation to make it possible to determine what is the best solution of the rivers. No race can surpass the Chinese in patience, perseverance, and powers of concentration upon an intellectual problem. Those characteristics are essential for scientific research work. Scholars have, throughout the ages, been the most highly respected members of the community. Conflict has never affected the reverence of the nation for learning. Destruction caused by warfare is nothing new in the land; it has always been followed by active reconstruction. We may therefore expect that Chinese engineers will during this century make valuable additions to the general store of knowledge concerning water control. Meantime, let us see what has been accomplished in recent years.

The hydraulic problems of China can be divided into five sections, of which the first three have always been of vital importance to the life of the people, the other two have come into prominence in recent years. These sections are :—(1) flood prevention; (2) irrigation; (3) river and canal navigation; (4) port development; (5) water power utilization. Unfortunately, it not infrequently happens that plans, ideal for any one of these sections, would, if carried out, injuriously affect works concerned with one or more of the other sections.

Much of the task of bringing waste land into cultivation, of draining swamps, and the construction of canals for irrigation, was, for more than 2,000 years, performed in China by the State, but there was no central organization for planning practical methods of controlling the rivers in all their lengths. It was often done in a haphazard manner, and frequently political rather than economic considerations affected the schemes. Each district carried out the works of which local officials approved, or had initiated, and often the work on one section of a river adversely affected another district.

The Famine Relief Commission's Work

The Chinese International Famine Relief Commission (C.I.F.R.C.), formed in 1921, organized an Engineering Department (1923) to unify, as far as possible, the technical work planned to fight flood and famine in China. This Department, especially in recent years, has been supported by and has worked in co-operation with the Central Government and other Chinese organizations. It is possible to give only a general outline of the difficult water-control problems which it has studied and the valuable work which it has accomplished in recent years. The publications of the C.I.F.R.C. and the contributions made by its engineers to technical societies in China, which deal in detail with individual projects, have been freely drawn upon in this attempt to provide a bird's-eye view of hydraulic works, particularly those concerned with flood prevention in different parts of a very large area of land. Amongst the foreigners who have earned the gratitude of those able to appreciate their work for China are Major Todd, Sir John Hope Simpson, and Messrs. Stroebe, Eliassen, A. M. Shaw, and Boudrez. A tribute must also be paid to scientifically trained Chinese engineers, amongst whom are Hsu Shih Ta, C. Y. Kao, T. C. Hsi, Pei I-hsiang, H. Li, and many others, who have done excellent work.

The work has included, not only a vast amount of dike construction, but the building and repair of many hundreds of miles of irrigation canals, surveys of all description, the laying out of many hundreds of miles of new roads in various parts of the country, provision of wells, reservoirs, new bridges, etc. It is impossible to estimate the economic value of the practical aid to the millions of Chinese affected by it, large numbers of whom otherwise could never have survived. The engineers have lived in districts infested with bandits or stricken with famine or flood, and have often suffered privations and faced dangers to life. It has become common in these days to jeer at the mention of "the white man's burden," but foreign engineers have carried the burden in China, and deserve recognition not only for technical ability, but for their courage. They have convinced Chinese officials of the necessity for an official centralized water-control authority for the whole country and of the efficiency of modern methods of construction. In the decade 1927-37 the State, aided by foreign experts and finance, encouraged scientific researches and carried out excellent hydraulic engineering works.

Devastating Floods

The awful destruction that has been caused by floods will be realized when it is stated that in 1931, when four rivers broke their banks (principally the Yangtze), the loss of crops was estimated at 400 million dollars (silver), and 140,000 people were drowned. In 1935, in one district affected by a break in the Yellow River dike, from four to five million people were practically deprived of all means of sustenance. An area of 6,000 square miles was flooded, and the total loss of property was estimated at 240 million dollars (Chinese silver currency). That was only in one district. At the same time in other parts of the country enormous losses of life and property took place. In the Yangtze Valley 9,700 square miles in area were inundated, and near Hankow 10,000 people were drowned in a few hours during the 1935 floods. The total loss by floods in 1935 was estimated by the Chinese Maritime Customs at 28 millions. In these days of erratic currency values it is difficult to give estimates in sterling, but in China a dollar is always a dollar for the peasant, whatever its value for exchange. At the time of writing, it is difficult to know what is the damage done by recent floods. It is said that the Chinese willfully broke down the dikes in order to harass the invaders, a strategy often employed in warfare, but involving great sacrifice. The Yellow River surged through a gap a quarter of a mile wide and more than 400 square miles of land were submerged. Nearly 700,000 refugees fled from the area. It is believed that in the defence of Hankow dikes will be cut.

The River Systems of China

It is impossible in any map of China to give the reader a complete idea of the enormous number of creeks that criss-cross thousands of square miles in Central and S.E. China. Every engineer knows of the Grand Canal of China, about 1,000 miles long. It is only one of the several important artificial waterways which were constructed for economic and administrative purposes centuries before navigable canals were made in England. Wherever possible, the rivers of China are linked by canals; for hundreds of years there was continuous transport of goods and passengers by inland waterways from Canton to Peking, 1,400 miles, except for a short distance of 40 miles, where there is a path over the mountains that separate the watersheds of the Yangtze and Canton river basins. There are twenty-six running miles of creeks, canals, etc., to each square mile of the large area of cultivated fertile plain in the Yangtze delta. In the Canton delta of South China, personal observation leads the writer to believe that in places that record is exceeded.

The most important river systems can be placed in four divisions. There are the five relatively small, but densely silt-laden rivers of North China, which converge at Tientsin, and have one common outlet to the sea, the Hai Ho. There is the large area supporting about 100 million people that is affected by the Yellow River, 2,500 miles long—"China's Sorrow"—and its numerous tributaries; these rivers are also heavily laden with silt. They drain an area of 320,000 square miles. "The problems of flood control presented by the Yellow River are the greatest that confront river engineers of this age," said Mr. A. M. Shaw, formerly Consulting Engineer to the Chinese Government. The silt load in some of the main feeders on occasions has been found to be as much as 40 to 45 per cent by weight with an average silt load for the lower river of about ten per cent. It has been estimated that 1,200 million tons of silt must be on the average annually transported by the Yellow River to the sea, and about 43 million cubic yards of silt are deposited each year in its channel, raising its bed from 4-ft. to 5-ft. each century. During the period since 2278 B.C. to this day, over which authentic records are available, the Yellow River has changed its course to the sea fifteen times, through the failure of a dike and the deposit of silt in the riverbed. In recent years there was formed a new river, 400 miles in length, from one half-mile to 50 miles in width, which entered the sea hundreds of miles south of its former mouth. This change, of course, on the part of the river submerged farms and villages, swallowing up rich agricultural land which had sustained 500 people to the square mile. It was stated by a competent engineer that $2,000 (silver) would have prevented this disaster, but the cost of repairing the breach was estimated at five million dollars.

Yellow River Migrations

At one time the river ran north by Tientsin, and at another it emptied in Central China into the Yangtze, near Chekiang, hundreds of miles to the south, as it threatens to do again. It now enters the ocean 600 miles up the coast from a former mouth. The average flow is about 300,000 cusecs.; the maximum flood discharge is about 500,000 cusecs., but in the 1933 floods it reached 750,000 cusecs. The average velocity is about 8-ft. per second, and the maximum surface velocity is about 10-ft. per second. When the velocity of flow falls below 3-ft. per second, deposition of silt is rapid and the rising floods overtop the existing dikes and a new page of sorrow is opened. This silt is so fine that 98 per cent of the grains in tested samples were less than 1/1,000-in. in diameter, and some were as small as 1/10,000 of an inch. It is rapidly picked up when velocities exceed 3-ft. per second.

The old Chinese tradition was that restless dragons stirred the mud in the rivers, creating frequent calamities. Even in recent years foreign engineers have had their work of construction delayed in rural districts while rites to propitiate the river dragons were carried out. The boats on many of the rivers of China, and the junks on the coast, have eyes in order that they may see. It is not easy to eliminate superstition in peasant and seafaring communities in China. In some places the old bronze cows still remain to watch over the unruly waters.

With eighteen years of practical experience on river conservancy works in China Major O. J. Todd said (1935): "China can be saved the losses and horrors of these repeated Yellow River floods if she wills it. The work should go forward with the same technical skill that America is using on a dozen major projects, each of which is more costly than this." A committee of engineers, backed by a stable and efficient government, and with ample financial resources, could spend hundreds of millions of pounds sterling on water control in China, with results that would amply justify the expenditure. Some idea of the magnitude of the work connected with the Yellow River may be gained from the statement that a conservancy scheme planned for a tributary, the Fen Ho, was estimated to cost 12.8 million dollars (silver), of which about eight million dollars was for flood control and the remainder for irrigation, involving the use of pumping plants. The total annual benefit to be derived from that expenditure was given as 5,600,000 dollars.

A loan of 12½ million dollars (Chinese currency) was made from the British Boxer Fund to finance the first part of a scheme to improve the Hwai River, which flows between the lower Yellow and Yangtze Rivers. Its outlet to the sea was choked up by a Yellow River migration, and its diversion has adversely affected the Grand Canal and areas affected by its big overflow. The Hwai scheme is a typical example of large-scale hydraulic planning to solve not only the flood problem, but to provide a supply of water for irrigation, to increase navigation facilities and to reclaim large areas of waste land. More than 100,000 square miles will be affected by these improvements, which, when completed, will include work on the Grand Canal.

Chinese Dikes

The Chinese have always shown ingenuity, and in times of emergency have dealt with perils due to Nature's forces in a resourceful manner, but with primitive tools. To control the floods they have, through the centuries, depended mainly on enormous earthen dikes. These dikes have been sodded, where possible, to prevent erosion. Broad earth dikes are built on both sides of the river where no rocky slopes act as natural barriers. Willow trees, grown along the toe or in groves between the dike and the channel, protect the dike, but where practicable other protection is used where the current carries the stream in towards a concave bank.

Hundreds of miles of enormous dikes have been built up in many places in North China of unprotected loess soil, which, when attacked by the swirling waters of a flood, dissolves like sugar and a breach is made. The protection of this loess embankment is essential for permanent work.

The double dike method is used in many places. The outer or "official dikes" are as much as five or eight miles apart, but local farmers frequently build inner or "people's dikes," as close as one mile apart. If the main dike is overtopped, the area between the two dikes provides an extra channel in emergency and the land can be cultivated in normal times.

A general idea of the great volume of some of the earth dikes may be gained from the fact that the Yao Ti dike (11.2 miles long) on the Yangtze (built in 150 days after the 1935 floods), involved the placing of more than nine million cubic yards of earth, or sufficient to build a dike nearly 16-in. square around the earth at the equator. On another stretch of the Yangtze about 57 miles long, the main dikes were completely rebuilt by C.I.F.R.C. engineers in 1932 to a height of 1-m. above the flood marks of 1931. At the peak of the operations, 15,000 men were employed. A stone-protected dike that reclaimed three towns and much good farming land that had been ravaged by the Yangtze for seven years was built by the C.I.F.R.C. engineers in 1925 at a cost of 50,000 dollars. At the next harvest the crops from the reclaimed land were valued at one million dollars, showing a return of 20 to one on costs of the work in the first year. After the 1924 floods in Hopei Province, similar results were obtained; dikes costing 50,000 dollars reclaimed land from which the first harvest yielded a return of 20 to one on the cost of the work.

The huge dikes and bank protection of the Yangtze and Yellow Rivers, like the Grand Canal and the Great Wall, are colossal monuments of the human labor that was used in their construction. The thousands of miles of earth dikes built in China represent very many millions of man-power hours.

The ingenious Chinese have devised a unique method of dike reinforcement. A cereal—kaoliang (millet)—grown in North China, has a long and thick stalk. These plants, with roots attached, are piled full length in great stacks along the dikes. Large quantities of hemp are twisted into ropes about 2-in. in diameter. Stakes end cross-bars from willow trees hold the work in place when fastened back by the ropes. Alternate layers of kaoliang stalks and soil are laid, each about 6-in. deep, with kaoliang roots facing the river. The layers are tramped down by hordes of people. That is a rough outline of a method often employed in the North. It is suited to hand labor, where wages work out at about 3d. a day, and where it is essential to provide employment when work on the land is impossible.

The New Methods

Engineers with long experience in China state that the stone-revetted dikes, used in many places in Shantung Province, give the best type of protection, but the difficulty is to obtain stone in many parts of the vast alluvial plains where the dikes are built. An innovation was the introduction of a pile driver to place a pile trestle across a new channel of the Yellow River for building a dam to turn the stream back into its old bed. Long heavy piles, four in a set or "bent," were driven in. The sets were spaced every 10-ft. across a gap 800-ft. wide. A light railway, placed on a trestle built on the deeply driven piles, brought stone from the banks and dumped it. More than 40,000 cubic yards of stone carried in 300 junks from more than 100 miles upstream went into this diversion dam. Mats, bags of earth, and kaoliang stalks were used to make the dam watertight. Some 25,000 men were at work. The C.I.F.R.C. financed 24 per cent of the scheme, which cost 1,500,000 dollars, and Shantung Province supplied the remainder.

Although an unlimited supply of cheap man-power is available near all the rivers of China, the modern dikes vary in construction, according to their situation and the materials available. After many failures to protect three large towns on the Yangtze, 300 miles below Hankow, by the old type of earthen dike, 9,000-ft. long, a new method of dike construction was employed. Sheet piling was driven 14-ft. deep through layers of sand and clay. Behind the sheet piling a ditch 10-ft. deep and 10-ft. wide was dug, 2,000-ft. in length. This ditch was filled in with carefully selected clay, tightly packed. This clay core was carried up through the center of the whole length of the dike to a height of 3-ft. above maximum flood level. The dike rose 25-ft. above the flats and was made 250-ft. wide at the base. A heavy layer of large stone or rip-rap protects the dike against wave wash. It has stood as a monument of the efficiency of the design and supervision of the C.I.F.R.C. engineers.

Dikes will always be the main factor in the control of China's rivers. Improved methods of transport for materials, together with modern methods of construction and supervision by competent engineers, have made some of these important structures much more reliable. Although dredging has been used extensively on the Mississippi, and is practicable on certain stretches of the Yangtze, it does not find favor with engineers who have had experience with the Yellow River, but it has been used on other rivers in China.

World Records

The River Yangtze, 3,200 miles in length, is navigable for a longer distance than any other river in the world. With its tributaries, it drains an area of land about six times the total area of the British Isles; about 180 million people live in its basin. This river has produced the world's record for the volume of water carried in its channel, viz. 2,531,692 cusecs. (Nanking, July 19, 1915). In 1915 the annual mean discharge was 1,050,000 cusecs. The corresponding record figures for the Mississippi, which has the highest record for world rivers other than those in China, are 1,617,000 and 225,000. The highest level recorded above zero for any water level in the world is held by the Yangtze which in 1871 attained the astonishing height of 275-ft. in the Wind Box Gorge, about 1,100 miles inland. The volume of solid matter in suspension carried annually past Hankow (600 miles up the river) is estimated at 5,000,000 cubic feet, 2,500 times the amount of silt that is carried past London Bridge. Such records must complicate the design of engineering schemes.

The primary cause of floods is heavy rainfall. All over China rains occur mostly in summer time, diminishing in intensity from the south, where on the coast it averages about 80-in., to the north-west, where the average is about 11-in., and even less in Mongolia. Typhoons cause intense and sudden precipitation, especially against mountain slopes. Torrents run off deforested hills like storm water off a roof, eroding the easily scoured soil, which, in North China especially, is very fine in texture mostly of wind-blown origin. It is this "loess" soil that chokes the rivers of North China, and is carried by the giant tributary, the Han, into the Yangtze at Hankow. For the six days, July 3 to 8, 1935, in Central China, the following records were taken;—at Wufeng, 52-in. of rain fell; at Ichang, on the Yangtze, 350 miles above Hankow, 30-in.; and at Chushan, on the Upper Han, 24-in. It was estimated that 14 cubic miles of rain fell on the basin of the Han in those five days (one tributary of the Yangtze).

In 1931 an immense new lake, 130 miles long and 70 miles wide, was formed with Hankow at its lower end. The Han brought into the Yangtze 1,060,000 cusecs., as compared with 812,000 cusecs. maximum discharge of the Yellow River. This peak flow of the Han lasted two days; the maximum flow of the Yangtze past Hankow, including that from the Han, was 2,365,000 cusecs.

The floods along the Yangtze often have brought disaster to a population running into millions, but they are soon forgotten by the outside world. The factor of safety of many of the dikes is low. Thousands of men, women and children repair breaks when the waters have fallen—on one dike 50,000 people were at work in April, 1927, nearly every one carrying earth in baskets at each end of a pole. It would take a volume to describe in full the story of the Yangtze "dragons," but even if they will never be exterminated they will certainly be tamed by applied science in the not distant future.

Finally, there is the river system in the south-east, converging into the river that flows past Canton. The waters debouch into the ocean through the mouths of a delta, one channel bringing inland commerce from Canton to the port of Hongkong. During floods in 1915 the river at Wuchow, South China, rose 61-ft. above lowest water mark. At the highest stage 2,100,000 cusecs. passed Wuchow, as compared with the record of 1,617,000 cusecs. for the Mississippi. These rivers fertilize, and are arteries of commerce for a semitropical area in South China, larger than Britain, and densely populated.

Floods are less frequent than in North and Central China, but there is rapid erosion. Droughts are unusual; irrigation and transport are the main water-control problems in South China.

The Canals of China

The rivers and canals are the highways of commerce, but enormous volumes of silt brought down from the hills and river banks are deposited in the riverbeds, canals, and harbors, in addition to vast quantities carried each year into the sea. Many of the canals require extensive dredging and more efficient protection against floods. Certain experts state that dikes, even if aided by detention basins, cannot prevent future floods from some of the rivers which carry such a heavy mud load. They say that the source of the trouble must be dealt with, and that soil erosion in the hills must be prevented. That is more easily said than done, for the urge for food and fuel has led to great deforestation. Even the almost barren hillsides are cultivated in places. But the Yellow River Commission has tackled the problem by setting up a field laboratory to experiment in various methods of soil erosion control. It will take many decades for practical results to be obtained from that angle. Meantime, engineers have urged improvements in dike construction and the building of detention reservoirs to iron out and detain, if only for a few hours, the highest crest floods. The scheme presents many attractive possibilities, such as the production of electrical energy, irrigation of land, etc., as well as flood control. But a closer examination reveals certain fallacies. Flood prevention reservoirs must be kept empty for emergencies, but reservoirs used for power production and irrigation demand exactly opposite conditions. There is a difference between detention and storage of water. Neither power production nor irrigation could be operated on the erratic supply provided by the floods of many of China's rivers.

There are other problems as yet unsolved. What is the increase in the power of erosion of the riverbed due to clarification of the water as a result of detention? The Islam Weir of the Sutlej Valley project in India collapsed in 1929. It was one of four division dams for that huge irrigation project. The flow passing the dam having been partly relieved of its load, picked up material from the riverbed below the dam, and so deepened the channel. The river drooped so much that a large portion of the downstream apron was destroyed.

The general arguments for and against the use of detention reservoirs are well known. The enormous volume and fineness of the silt in many of the rivers of China greatly complicates the problem of any system of detention; the cost of such works would, as a general rule, be prohibitive. Building detention reservoirs in the upper course of silt-laden streams that finally flow past Tientsin is, however, said to be the only practical solution of the problem of providing a navigable waterway for that port.

Lakes As Detention Reservoirs

The Yellow River carries a great load of silt of a unique type, which, combined with the topography of the land, makes the value of detention reservoirs in the lower valley doubtful, but the short duration of the floods seems to favor their use in the upper reaches. Mr. E. W. Lane, an American expert concerned with the Boulder Dam, and possessing considerable knowledge of China's rivers, writes: "A river may be induced to excavate its own channel by constructing a reservoir upstream to remove the transported solids. The Yellow River, for example, offers the favorable conditions of steep slope, fine material, heavy silt content, few tributaries, and a reservoir site." Other experts have pointed out that the river has a silt load amounting, according to estimates, to something like 1,000,000 cubic yards of solids per hour. It is obvious that there would be a rapid decrease in the capacity of a reservoir which abstracted any considerable portion of silt from the Yellow River in flood.

A plan of lower detention reservoirs has been suggested for the Lower Mississippi. On the Yangtze large lakes, such as the

(Continued on page 202)

The Cotton Industry in North China

By S. OKADA

THE history of cotton cultivation in North China goes back to remote ages, beginning almost contemporaneously with the introduction of Buddhism into China. This crop was first raised as an agricultural product about 1,000 years ago, but its propagation and encouragement among the masses did not take place until rather recently. To be more exact, it was not until 1919 when cotton cultivation received a strong impetus from the spinning industry which recorded a sudden spurt about that year and continued to encourage cultivation. In consequence land used for the raising of cotton has increased in area considerably.

According to the 1937 statistics the area of land used for cotton cultivation in China totalled 3,500,000 hectares and production of raw cotton amounted to 14,000,000 *tan* (1 *tan* equals 60 kilograms) an amount which is equivalent to 12 per cent of the world's total production, and next to the United States and India in rank. The three provinces of Hopei, Shantung and Shansi are the main producing centers of North China whose average annual production is about 3,770,000 *tan* or 36 per cent of China's total. The area of land under cultivation and the cotton production of these three provinces for the past five years ending in 1936 are given in the table below.

CHINA'S COTTON CULTIVATION AND NORTH CHINA'S POSITION

Year	*Land under Cultivation (1,000 mu)*			*Cotton Production (1,000 tan)*		
	China	*3 Provinces of North China*	*Percentage of North China*	*China*	*3 Provinces of North China*	*Percentage of North China*
1932	37,099	12,288	33.1%	8,160	3,206	38.3%
1933	40,454	12,790	31.6%	9,774	3,416	34.9%
1934	44,971	15,096	33.6%	11,203	4,771	42.6%
1935	35,026	9,185	26.2%	8,143	2,826	34.7%
1936	55,041	17,685	32.1%	14,430	4,750	32.9%
Average for five years	42,518	13,409	31.2%	10,331	3,774	36.5%

1 *mu* is equivalent to 1,000 square meters.

Statistics from S.M.R. North China Office, *Hokushi Bosekigyo Kiso Shiryo* (Source Book on the Spinning Industry in North China), 1938.

Adding the productions of Honan and Shensi Provinces to those of the three mentioned above the total for North China becomes 49.7 per cent of the entire country. Since there are in North China only 26 per cent of the country's total number of spindles which are the main "consumers" of raw cotton, the chances of exportation of this product are great indeed.

The following table gives the amount of cotton exported and consumed at home during the years 1933 to 1936.

DEMAND AND SUPPLY OF NORTH CHINA COTTON

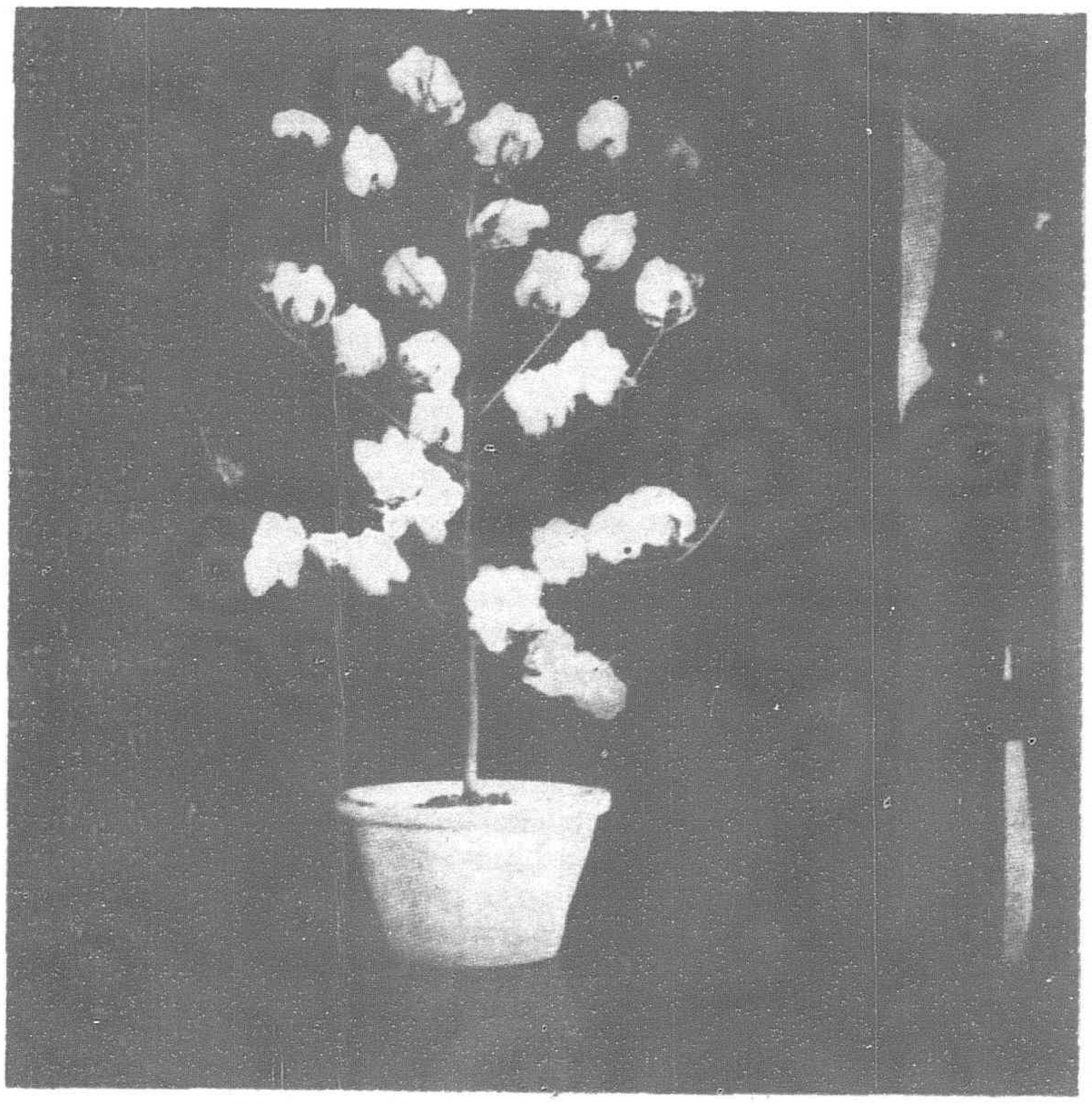
(*1,000 tan*)

	1933	*1934*	*1935*	*1936*
Production	3,416	4,771	2,826	4,750
Imports	121	53	37	11
Exports	461	162	202	329
Internal Consumption	3,076	4,662	2,661	4,432

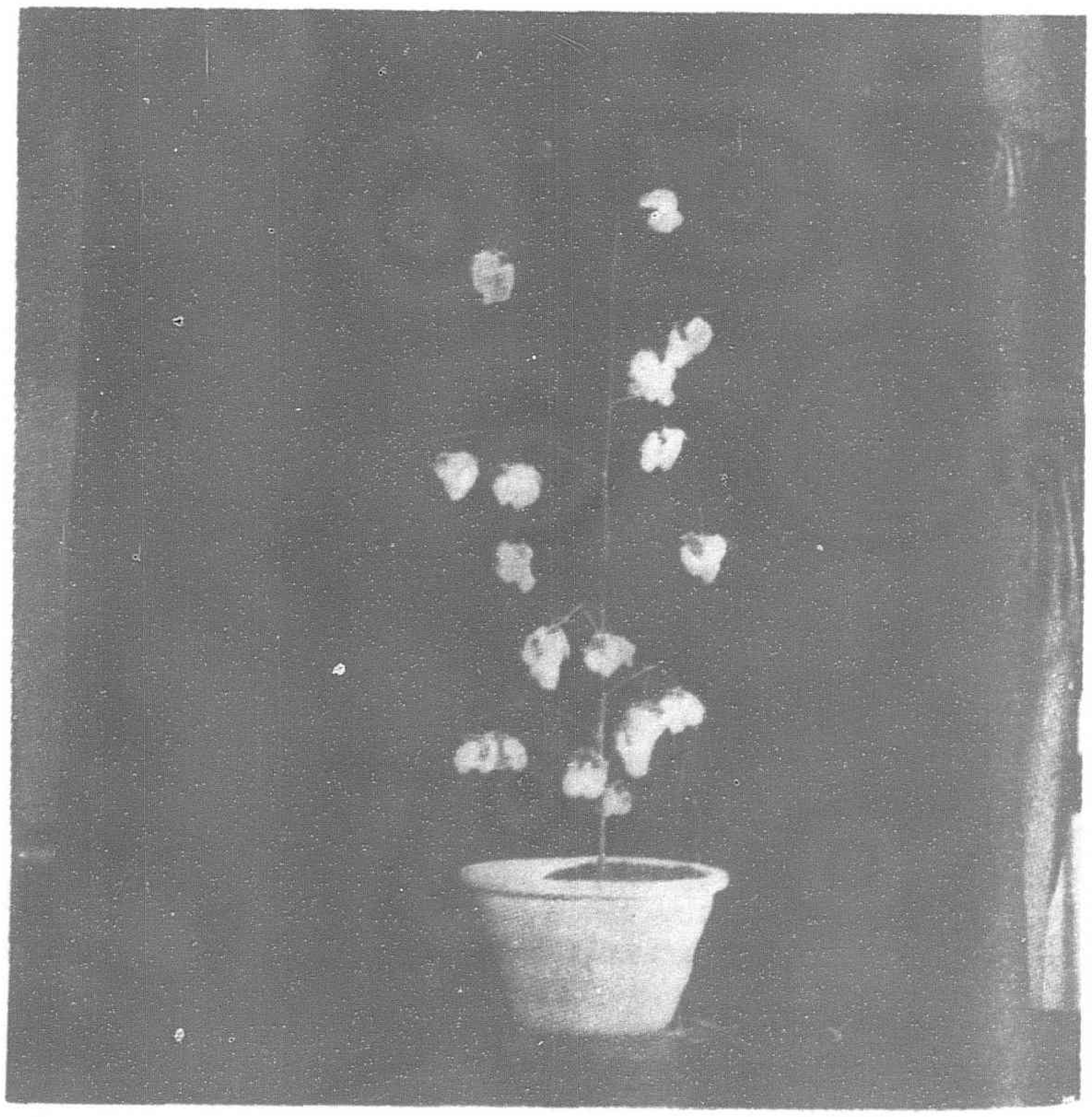
Statistics from *ibid*.

Advantages in North China

Unlike the highly mechanized and industrialized cotton cultivation in the United States, cotton growers in North China are farmers of an extremely low standard striving for a meager livelihood. These people barely meet their fundamental needs such as food, clothing and shelter through their main agricultural pursuits and anything more that they want they must get through raising cotton, wheat and other commercial products. Since cotton cultivation yields the largest income among farm products it is quite indispensable in the rural regions of North China and is consequently regarded as one of the big five crops namely, maize, kaoliang, millet, and wheat. The importance which cotton cultivation holds in agricultural economy is very great as it can be seen from the following table, and in fact forms the basis of agriculture in this region.



Specimen of improved American upland cotton exhibited by the Tung-hsien Agricultural Experimental Station



Specimen of native cotton exhibited by the Tung-hsien Agricultural Experimental Station

INCOME AND EXPENDITURE OF 1 *Mu* OF LAND ACCORDING TO CROPS

(*Unit—Yuan*)

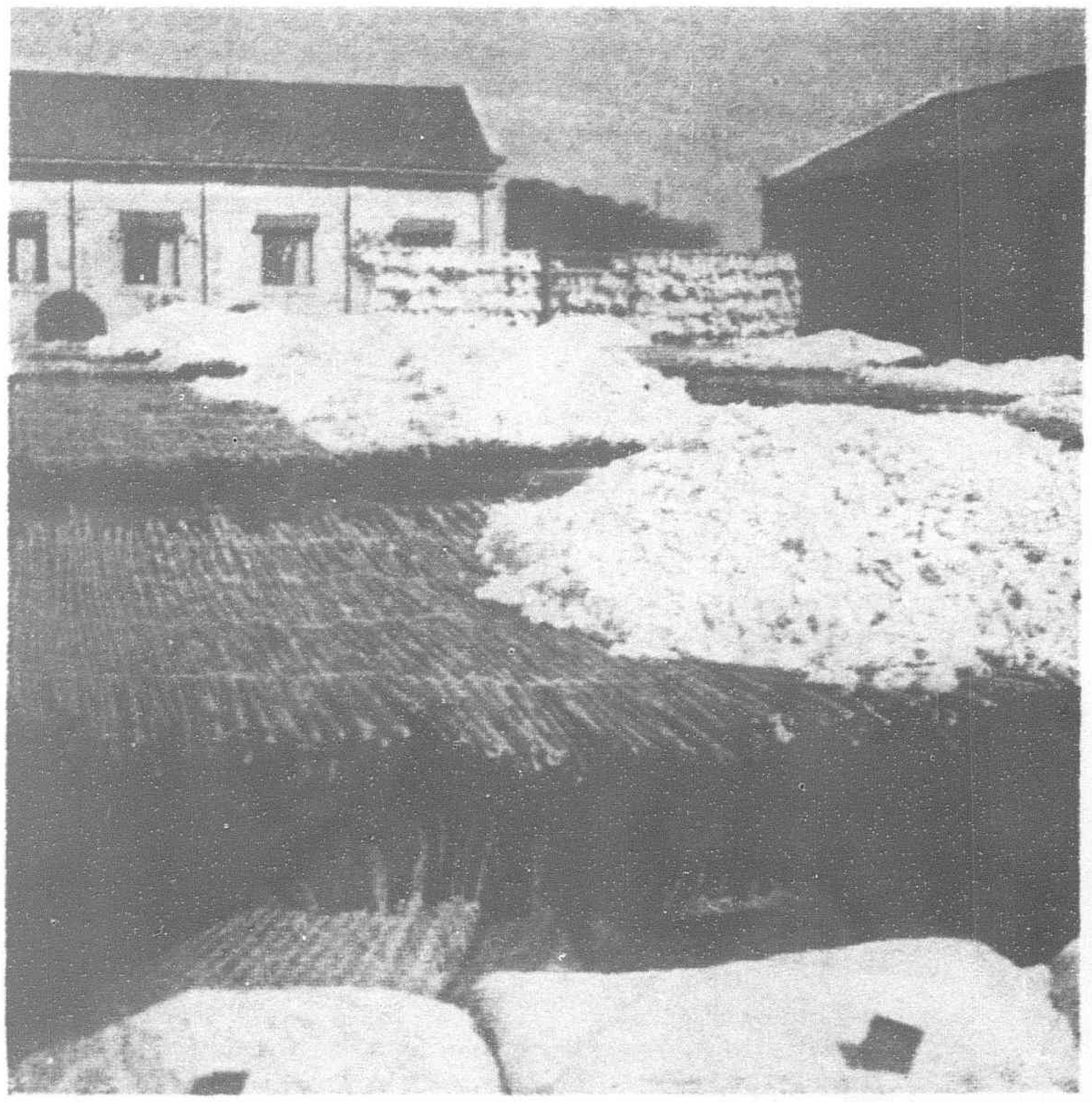
	Income	*Expenditure*	*Profit*
American Cotton	25.80	17.90	7.90
Native Cotton	19.25	16.17	3.08
Wheat..	10.50	11.30	— .80
Kaoliang	10.50	9.70	.80
Millet	11.70	12.20	— .50
Soya Beans	9.10	7.20	1.90
Groundnuts	14.40	15.60	—1.20
Maize	8.50	9.90	—1.40

Statistics from S.M.R. *Hokushi Yoran* (General Survey of North China), 1937.

Moreover the cotton yield of Hopei and Shantung is 26 *chin* (1 *chin* equals 60 kilograms) from 1 *mu* of land which is a little better than the 22 *chin* per *mu* average for China as a whole indicating that this part of the country is more favorably suited for raising this particular crop.

Natural Conditions in North China

Since cotton is a native plant of tropical countries, it demands more sunshine and higher temperature than other crops. The location of the cotton raising regions of North China is 37 degrees North Latitude or slightly to the north of the average location of the world's principal centers which is generally regarded as 35 degrees North Latitude. This places North China on a climatic and geographic disadvantage and consequently the cultivation of the higher grade varieties of cotton is limited. Varieties like the Egyptian cottton which require a much longer time to attain, growth, a warmer climate, and much humidity cannot be raised in this region. Therefore the selection of the best type for cultivation is very essential, since there are species like the American upland cotton which does quite well under dry climate and irregular rainfall, and ripens within a relatively short time. Regardless of the poor climatic conditions (in comparison to the best producing centers of the world) North China is by far the better suited than Japan, Chosen or Manchuria.



Picked cotton assembled at the Tung-hsien Agricultural Experimental Station, North China

Period of Maturity.—In North China seeds can be sowed in the middle of April and harvested in early November or a period of 200 odd days. This period is somewhat longer than that of Manchuria or Chosen but a month shorter than the American cotton belts. In short the period of growth is satisfactory.

Temperature.—The temperature of the cotton growing season, namely, for the six months between May and October, is nearer to the ideal. The weather for June, July and August is especially good, the highest temperature for this period being 30 degrees Centigrade and seldom below 20 degrees Centigrade at the lowest. Unlike Chosen and Manchuria the thermometer rarely registers below 10 degrees Centigrade in May, thus facilitating germination considerably.

Rainfall.—Rainfall in North China is about 600 millimeters on the average which is approximately equal to that of Manchuria but half of that of Japan. Subtracting the rainfall of the rainy months July and August which is between 300 to 400 millimeters the year's average according to months is exceedingly low.

In the word, rainfall of North China is relatively small and distribution very irregular. Crops must face a dry season from the very beginning to the time they attain full growth, then during their fertilization period or in July and August rainfall is so heavy and thunder so frequent that a poor yield results. However the rainy season ceases with the passing of these two months and with the coming of September and October dry climate sets in again to promote ripening and harvest.

Sunshine.—To make up for the low ranfall North China enjoys much sunshine. Being a wet month, the month of August is an exception to this rule but the average number of sunny hours for the six months is approximately 250 hours per month, which is about the same with Manchuria. Both have plenty of sunshine.

Varieties of Cotton Cultivated.—Native cotton and the American upland cotton which has been imported from America are the main varieties under cultivation in North China. Special characteristics of the former are its short but strong fibres and high ginning percentage. It is best suited for making threads below No. 20 size, for thick-thread spinning, for making cotton for stuffing, and for making woollen and cotton mixtures.

King and Tries varieties are the primary upland cottons which are grown. These varieties ripen very early, their fibres are longer than the native variety, and are used mainly to produce threads of the No. 30 or 40 sizes. For these reasons these two varieties have become very popular and their cultivation has increased tremendously in recent years. It is predicted that they will hold a more prominent position than the native variety in the near future. It is interesting to note here that the significance of upland cotton was first recognized with the earnest encouragement by the Japanese in Shantung and central Hopei Provinces from about the year 1917.

The Cotton Policy

Policy of Increasing Production.—The question of increasing cotton production in North China has long been a matter of deep concern on the part of the proper authorities. Deliberations on the question have been going on for some time between the Provisional Government of Peking and the Japanese both of whom are represented in the Japan-China Economic Council, but of late cotton has been recognized "as a profitable agricultural product for native farmers and an important raw material for Japan." In line with this conclusion a policy for increasing production was adopted, execution of which will begin with the present year. The main points embodied in this plan are as follows :

(1) In North China a plan calling for increasing cotton production to 10,000,000 *tan* per annum at the end of a period of nine years beginning with 1938 will be carried out.

(2) The area of land allotted for cotton cultivation will be increased to 30,000,000 *mu*. Much care will be taken to prevent the decrease which might occur in the cultivation of wheat and other grains in enlarging the area for cotton cultivation.

(3) King's Improved and Tries will be selected for encouragement together with superior native varieties.

Parts of the plan to be carried out each year are given in the table below.

PROJECTED COTTON PRODUCTION FOR EACH YEAR

(*In 1,000 tan*)

	American Variety	*Native Variety*	*Total*
1938	2,246	1,958	4,204
1939	2,499	2,154	4,653
1940	2,803	2,369	5,171
1941	3,470	2,357	5,827
1942	4,199	2,343	6,542
1943	5,070	2,327	7,397
1944	5,972	2,310	8,282
1945	6,837	2,359	9,196
1946	7,665	2,335	10,000

The following are the points which will be carried out in the fulfilment of the policy.

(1) To increase and encourage the cultivation of superior varieties.
(2) To advance loans for the establishment of irrigation facilities.
(3) Establishment of publicity and encouragement organs.
(4) Strengthening of the supervisory system.
(5) Improvement of farming methods and the eradication of pests and plant diseases.
(6) Readjustment of land leases for small tenant farming, improvement of transportation facilities, rationalization of transportion rates, readjustment of the customs, encouragement of immigration, and the encouragement for increasing the production of foodstuffs.

The total estimated expenditure needed to carry out the Nine-Year Plan is approximately 29,128,000 yuan, while the establishment of irrigation facilities will require an additional 72,362,000 yuan which will bring the total well up to the 100,000,000 yuan mark.

Upon realization of the Plan and cotton production subsequently boosted to 10,000,000 *tan* per annum, this amount will be apportioned as follows:

3,500,000 *tan* to be consumed by the spinning industry of North China which will have by then a total of 1,300,000 spindles.

Other local consumption—1,000,000 *tan*.

Upon the revival of the spinning industry, Central China is expected to demand 2,500,000 *tan*, leaving 3,000,000 *tan* available for exporting to Japan.

Encouragement and Experimental Facilities.—With the unrestricted support of the Japanese authorities, the Provisional Government of Peking is working assiduously to complete its organization for the encouragement of the cotton industry, and other organs connected with the cotton policy. The various organizations are outlined briefly below.

Chinese in North China picking cotton

(1) *North China Cotton Industry Association.*—The membership of this organization is composed of prominent Hopei, Shantung and Shansi men in the cotton industry and reorganized groups of provincial cotton encouragement organs, and has its headquarters in Peking. For some time in the past the Provisional Government has given assistance in the promotion of enterprises financing and supervision in Shantung, Hopei and Shansi Provinces. This organization is semi-official in nature and is a juridical person of the Chinese Republic. Its capital is subscribed jointly by the Government and by the Japan-China Spinners' Association. It has invited Japanese experts to supervise cultivation, improve quality and to increase output. Through the Rural Agricultural Associations it distributes seeds of improved varieties, supervises cultivation and makes advances to those in need of funds.

(2) *North China Cotton Company.*—This organization was formed at Tientsin last spring as a cotton purchasing firm under the joint auspices of the Japan-China Spinners' Association and the Cotton Industry Association. At present it owns three press factories and engages in the distribution of seeds and the financing of rural cotton raising communities, but since its small capital of 3,000,000 yuan tends to limit its sphere of activities preparations to increase it to 40,000,000 to 60,000,000 yuan are now under way.

Agricultural Experiment Stations in North China.—The experiment stations dealing with cotton and other argicultural products that have existed from pre-China Incident days are listed in the following paragraphs.

(1) *Tsung-hsien Cotton Experiment Station.*—This experiment station is located to the east of Peking and was founded by Yin Tung, chief of the former Pei-Ning Railway Bureau, who with the assistance of the Japanese (especially Dr. Yoshida) created the experiment station under the management of the Railway in 1934. The services of a Manchurian expert (Mr. Iwasaki) was acquired from the S.M.R. which has operated a long string of experiment and encouragement institutions. This expert selected the most suitable site for the purpose and with the completion of the buildings, the station was ready for real work in 1935.

Since the foundation of the station up to the outbreak of the China Incident a total of six Japanese instructors and experts have been dispatched but two out of this group gave their lives to their cause, the weather conditions being disagreeable. Thanks to the untiring services of the other four pioneers of peaceful industrial development and to the generous efforts of Chinese assistants good progress was made, but unfortunately a brutal fate had to befall all of them in the form of bloody Tsungchow massacre carried out by the Chinese soldiers. The loss of these men is a grievous matter for the Chinese themselves.

Since then more earnest assistance has been given by Japan and 14 Japanese experts (S.M.R. men) detailed to the station in November, 1937, have carried on the work, while buildings and lands have been readjusted and a new entomology section created. Twenty-one Chinese who are co-operating heartily in the work have been added to the staff.

To-day this station is carrying on experiments to produce high grade seeds and to improve cultivation methods, while fertilizers and irrigation matters are also receiving due attention. In addition wheat, kenaff and other grains are being studied, and the eradication as well as the prevention of insect pests are occupying much of the experimenters' time. The benefits which the general farmers of North China will shortly receive from the enthusiastic work of the station will be great indeed.

(2) *Peking Municipal Agricultural Experiment Station.*—64 *chobu* of land (1 *chobu* is equal to 2.45 acres or 99.17 ares). Director—Mayor of Peking. 6 sections.

(3) *First Provincial Agricultural Experiment Station of Hopei at Tientsin.*—Yearly expenditure—4,000 to 6,000 yuan. 10 persons on staff.

(4) *Hantan Second Station*—yearly expenditure—4,000 to 5,000 yuan. Personnel—8.

(5) *Tsohochen Third Station*—Personnel—8. Yearly expenditure—4,000 to 5,000 yuan.

(6) *Titan Fourth Station*—Annual expenditure—3,000 yuan. Personnel—6.

(7) *Linfen Cotton Experiment Station.*—Unknown.
(8) *Linching Cotton Experiment Station.*—Unknown.
(9) *Chengting National Cotton Experiment Station.*—Unknown.
(10) *Tsitung National Cotton Experiment Station.*—Unknown.
(11) *Tsinan Agricultural Experiment Station.*—Unknown.
(12) *Ting-hsien Experiment Station for Public Enlightenment.*

With the outbreak of hostilities, the responsible persons of these experiment stations fled into safer regions carrying with them all valuable material and documents. Then came the anti-Japanese elements who utilized these stations for military purposes and left only the wrecks as reminders of what had existed before. No

(Continued on page 207)

Engineering Aspects of Air Raid Protections

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(Journal of the Calcutta Association of Engineers)

It is a feature of Nature that destruction is quicker and easier than construction, and throughout the recorded history of man there has been an incessant endeavor by groups of men to gain advantage by destroying the constructive efforts of other groups. This has now culminated in the application of the newly won power of flight to attack by impact poison, fire, and explosion, at any point within the area of an enemy's territory. The combatting of this attack by military methods is a subject for the artillery and aerial experts, but it is clear that no such counter measures can be entirely effective and it is therefore an urgent practical problem how the effects of destructive attack can be minimized. Just as there is a perpetual struggle in armaments to match armor plate or fortification against the projectile, so now a new struggle has developed between the protection of general human activities and the aerial bomb. The power of defence is hampered by the relative ease of destruction, but experience since the year 1914 has shown that some measure of protection is available and it is the object of these notes to promote a discussion of the engineering aspects of the problem.

Effects of Aerial Bombs

Aerial damage is produced by the impact of aerial projectiles and the release of the containers as splinters and their contents in the form of exploding gas, violent chemical combinations liberating great heat, or poisonous gases (or liquids).

The impact of a bomb depends on its weight, the square of its velocity, the angle at which it strikes, the area of contact and the distance in which it is brought to rest. The velocity in feet per second in falling from comparatively small heights is $8\sqrt{\text{height in feet}}$, but when falling from great heights the terminal velocity is a fairly constant value, depending on the size, shape, and smoothness of the bomb. Thus if the air resistance is 0.00001 lb.* per square foot at 1-ft. per second, the surface area is 2 square feet and the weight of the bomb is 20 lb., the air resistance is equal to the weight when the terminal velocity is 1,000-ft. per second. With a velocity of 1,000-ft. per second if a 20-lb. bomb is stopped in a distance of 1-ft., the initial impact force is 1,250,000 lb., or over 500 tons.

The impact varies directly as the square of the weight of the bomb ; inversely as the surface area of the bomb, the distance in which the bomb is stopped, and the surface air resistance of the bomb.

For similarly shaped bombs, surface area varies as the two-thirds power of the weights, so that assuming uniform smoothness, the impact generally varies directly as the one and a-third power of the weight and inversely as the distance in which the bomb is stopped.

As to the explosion, most explosives consist of unstable compounds including nitrogen. When chemical dissociation is started by a detonator the nitrogen atoms become nascent and recombine rapidly with one another, liberating heat. The formation of nitrous oxide (NO) absorbs 21,575 calories per gramme-molecule, so that the formation of nitrogen and oxygen from nitrous oxide liberates 43,150 calories for the production of one gramme-molecule of oxygen and one gramme-molecule of nitrogen or about 700 calories per gramme of nitrous oxide. This figure is fairly representative of high explosives and shows that they produce less energy than ordinary fuels (The formation of CO_2 produces 97,200 calories or 97,200/44=say, 2200 calories per gramme of product). The difference lies in the rapidity of the combination and the lesser energy required to dissociate the explosive before recombination. Thus gelatine dynamite has about five times the violence of gunpowder, and the latter is stronger than a coal dust-air mixture.

The results of explosion are to convert the whole of the explosive into gas with a heat content of, say, 700 calories per gramme (1260 B.Th.U. per pound). If the mean specific heat of the gas is, say, 0.25, this means that its temperature might be raised if there were no dissociation to 700/0.25=2,800 deg. Cent., so that its volume tends to be increased some ten times that at N.T.P. The volume of the gas at N.T.P. is of the order of 1,000 times that of the solid (or liquid) explosive, so that the explosive tends to produce a volume of gas some ten thousand times that of the solid (or liquid) explosive. Thus a bomb containing, say, 10 lb. of explosive, occupying, say, 1/10th cubic foot, tends to produce 1,000 cubic feet of gas. At the blast the pressure is momentarily of the same order as would be required to compress the gas back to solidity, say, 10,000 atmospheres, or 70 tons per square inch.

In a rather general sense the momentary pressure of the explosion diminishes as the square of the radius of the explosion. If the bomb is 6-in. in diameter this suggests that at 25-ft. distance pressures of the order of one atmosphere are possible, which are more than sufficient to shatter ordinary window glass and break down ordinary walls.

The effective velocity of the gas corresponding to its heat energy (apart from its energy of simple expansion) is some 8,000-ft. per second, so that fragments of the bomb may acquire velocities comparable with those of rifle bullets (nearly 3,000-ft. per second) and cause great impact effects.

The incendiary bomb is often of the thermit type, which contains aluminium powder and iron oxide, with an igniter. The heat of combination of aluminium oxide is 392,600 calories per gramme. The dissociation heat of iron oxide is 195,600 calories per gramme-molecule, or about 1,200 calories per gramme, so that the substitution of aluminium for iron releases nearly 200,000 calories per gramme-molecule or about 900 calories per gramme of the whole mixture. The reaction is very violent, producing a temperature of some 2,000 deg. Cent., the iron melting and the incandescent alumina scattering in white hot sparks. The heat will convert immediately to steam small quantities of water brought in contact. The magnesium type of bomb liberates 6,000 calories per gramme of magnesium, but requires air to keep it going. Oil bombs liberate perhaps 10,000 calories per gramme of oil. Burning magnesium can " feed " on water by chemical decomposition.

Unless the incendiary bomb is very large it is not of itself productive of more than local damage. The danger is rather that of causing fire in inflammable materials.

Chemical bombs scatter, by a small charge of explosive, liquid or gaseous poisons and rely on the evaporation and diffusion of the gas for their action. Their impact effects have an important bearing on their ability to enter buildings. The diffusion of gas is conditioned principally by atmospheric conditions, but the whole air within a certain distance of the explosion may very rapidly rise to a dangerous degree of concentration.

The "Terminal" Velocity of Bombs

The velocity of a body in a vacuum simply varies as the square root of the height, so that a bomb falling from a height of 10,000-ft. in a vacuum would develop a velocity of 800-ft. per second (566 miles per hour). In the actual air the fluid resistance reduces the velocity and if the fall is sufficiently great the velocity ceases to grow as soon as the air resistance is equal to the weight.

The resistance to low levels is about 0.00001 lb. per square foot of surface area at 1-ft. per second for fish-shaped bombs, and as much as 0.001 lb. per square foot of diametral area for spherical bombs. The surface of a sphere is four times its diametral area, so that the spherical resistance considered as a surface effect is 0.00025 lb. per square foot of surface at 1-ft. per second. If the rear of the sphere is tailed off into a good fish-like form with small fins, the surface area may be some sixteen times the diametral area, but the resistance is then purely frictional and amounts to about 0.00016 lb. per square foot of diametral circular area, or about one-sixth that of the sphere.

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* This is about twice the minimum skin friction but the flow is never quite pure stream flow owing to the fins and the irregularities of the air.

The streamline form may have about three times the volume of the sphere of the same diametral section. If it is solid steel the weight is

$$62{\cdot}5\times 7{\cdot}6\times 3\times\frac{\pi\, d^3}{6}\text{lb.}$$

Thus an equation can be written—

(at terminal velocity) weight=air resistance

$$62{\cdot}5\times 3{\cdot}8\times\pi\, d^3=0{\cdot}00016\times\frac{\pi\, d^2}{4}\times vt^2.$$

$$vt=\sqrt{\frac{4\times 3{\cdot}8\times 62{\cdot}5}{0\,00016}\,.\,d}$$

$$=2436\sqrt{d}\text{ ft. per second.}$$

If the mean density of the bomb is only one-third that of solid steel, this is reduced in the ratio of $\sqrt{3}$ or to 1690 $\sqrt{d}$ ft. per second.

If $d=\frac{1}{2}$ ft. vt=1195-ft. per second.

or if $d=\frac{1}{4}$ ft. vt=845-ft. per second.

These velocities will not develop until the bomb has fallen considerably further than the height required to develop them in a vacuum, so that, for example, to obtain a terminal velocity of 845-ft. per second the height must be much more than.

$$\frac{v_1^2}{2g}=\frac{845\times 845}{64}\text{, or 11,106-ft.}$$

Larger bombs would have a greater terminal velocity, but since the height from which they are dropped will rarely exceed 22,500-ft., for which the full gravity vacuum velocity is 1,200-ft. per second, it is probable that actual contact velocities will rarely exceed 1,000-ft. per second and will be less than that for small bombs.

The equation of motion is :—

$$\frac{d^2h}{dt^2}=g-\left[\frac{\epsilon.^{-\frac{h}{h_0}}f\,.\,A_s\,.\,g.}{W}\left(\frac{dh}{dt}\right)^2\right]$$

where h=height above sea level in feet,

h_0=height of equivalent uniform atmosphere about 26,000-ft.,

f=friction in pounds per square foot of surface at 1-ft. per second velocity.

A=rubbing surface, square feet,

g=grav. acc=32-ft. per second^2,

W=weight in pounds,

t=time since commencement of fall,

ϵ=2.7183, the basis of the Napierian logarithms.

This can only be solved by arithmetical computation from differences, a tedious and approximate method.

Note as to Explosives

Destruction consists in rupture or lifting of structural parts. The energy required to produce rupture is rather small. Thus, to break a steel section by tension rarely requires more than 50 inch-tons per square inch, or, say (in round figures), 10,000-ft.-lb. The elastic energy which can be stored in steel frames is about 1-ft.-lb. per cubic inch, or, say, 4-ft.-lb. per pound of steel.

Thus if 1 lb. of explosive liberates, say, 1,000 B.Th.U., which is equivalent to 778,000-ft.-lb., if fully operative, it could break 78 square inches of steel section or lift 1 ton 350-ft. into the air, or be absorbed in 80 tons of previously unstrained steel, or lift its own weight to a height in a vacuum of 150 miles.

To give a comparison, 1 lb. of high explosive in ab orehole will loosen about four tons of rock. The elastic energy which can be stored in rock is only about 2-in.-lb. (=1/6-ft.-lb.) per cubic inch, or, say, 2-ft.-lb. per pound, so that four tons of rock can absorb about 18,000-ft.-lb. of energy of the explosive. If the charge were in the center of a cubic block, it would loosen four times as much material, but this still only uses up about ten per cent of the energy. The remainder is lost in heat, elastic strain in the subsoil, and gas velocity.

In a bomb explosion the dissipation of energy is much greater than in blasting operations, but even so, it is apparent that even five per cent of the caloric energy is capable of much damage and that there remains in the gas blast a very active power.

The Resistance of Ordinary Structures and Machines to Destruction

Structures and machines are designed to resist such loads as may ordinarily be applied to them and rarely have much marginal strength. In fact, with the advance of technique there has been a reduction in the proportional margin of strength. Thus certain old masonry and iron structures have considerably more material in them than was really necessary, but their joints were often weaker than would now be used. Materials have been better disposed and new substances of greater strength have been developed, but this advantage has been exploited to reduce weight, to increase size, or to allow better use of interior spaces. Jointing, in the form of continuous concrete, riveting, or welding, has greatly improved, but here again this advance has been used to reduce weight or to increase dimensions. Demolition of structures with such joints requires the detailed destruction of the joints, and continuous structures have proved much more resistant to earthquakes than the older types. Their resistance to fire is such that destruction is usually the result of the combustion of the fittings and contents rather than that of the structure itself. This does not apply, however, to the ordinary office or dwelling-house, or the older type of factory building with timber roofs and floors, which as a structure is little better than its predecessors for the last three thousand years. Such buildings are inflammable and are easily disjointed. Their brick walls are the strongest element, but even these will not withstand tension, such as may arise from shock. None of these structures, old or new alike, can resist a direct hit of a large projectile. The older types can only resist interior explosion to the extent that they may have strong interior walls. On the other hand, the frame of a modern building (concrete or steel) may only suffer local damage by explosion.

As to machines, the heaviest types, if well bolted to their bases, are more liable to be damaged by falling parts of buildings or by the collapse of a supporting floor than by direct gas pressure. The danger of destruction by inertial effects of sudden stoppage is greater, to say nothing of the hazards of damage to boilers and pipes, causing the escape of steam, gas, or oil, causing incidental fire or explosion.

Apart from hits, the dangers are from splinters and anti-aircraft projectiles, gas pressure, fire, and external poison gas. The last is a matter of gas-tightness, which will be considered elsewhere.

Walling is often sufficiently strong to resist the splinters and pieces of shrapnel, but windows offer practically no resistance, and doors and roofs are frequently too weak to avoid penetration.

As to explosion and gas pressure, if this rises to a few pounds per square inch, unless windows are covered with strongly made shutters complete destruction of glass is probable. Even with shutters, if there is free flow of air to and from the interior, the glass may be broken by the after-suction effect.

On the whole, it may be said that the existing arrangements give little or no protection except to low-placed interior rooms in a high building with strong roof, floors, and walls.

The Increase of Resistance to Destruction

The paramount consideration at the present time is how the destructive effect of bombs may be reduced. Both old and new structures must be considered, and obviously the old structures present the greater difficulty. Economic considerations obviously enter into the question very largely, but will be dealt with later.

As a first step it is suggested that all new buildings should be wholly of fire-resisting materials. Roofs, floors, window and door frames, and partitions should then be of metal, or metal with cement or ceramic material. Timber, if used at all, should be treated with chemicals so that it is non-inflammable. Plastics should only be of the non-inflammable kinds.

Equally important is the reduction (if possible to zero) of inflammable contents of buildings. Furniture should be of steel or chemically treated wood, blinds and curtains of chemically treated fabrics. As a broad principle, it should be stated that no room should contain enough inflammable matter to enable a fire to extend beyond it. The open fire should be abolished altogether. All unnecessary furniture and decorations, unless fireproof, should be dispensed with. Steel furniture, with closed doors, is indicated in libraries and offices.

In those places where inflammable items exceed this limit the structure should be especially fire resisting and especial arrangements for the exclusion of air desirable, to deprive the fire of oxygen.

Electric short circuits can be to a great extent reduced by proper conduits, reactors and fuses, and location of same in non-inflammable construction, but gas still presents serious problems. This is important, since the use of gas is one of the principal means of economizing natural energy. The storage of oils, especially volatile ones, presents peculiar difficulties and they should be confined to specially protected spaces, with cut-off sumps in case of escape and means of cutting off air access.

With new buildings of the more expensive type these changes do not necessarily add prohibitively to cost, but with the smaller residence a very difficult economic problem is raised. The substitution of fire-resisting material for all present materials may easily increase costs in small residences by 50 per cent, although if the change became general this addition might be somewhat reduced.

After fire there are the effects of concussion to be considered. Indirect concussion, of the order that breaks window glass, is less serious. Glass may be strengthened by wiring, triplex interlining with transparent plastics, or by adherent transparent plastic, or may be protected by steel shutters on both sides. Modern factories with all-glass walls may not be structurally damaged by explosion. Steep roofs with concrete slabs may deflect or predetonate the smaller bombs.

Direct concussion, i.e., linear reception of explosion pressure from comparatively short distances, is a much more serious matter and compels the designing of walls in the same manner as floors and of the structure as a whole to resist large overturning movements and shoving shears. When it is considered that the gas pressures may easily be 500 lb. per square foot, and that wharf decks and factory floors are rarely designed to carry larger loads than this, it will be seen that peculiar structural problems arise. Fortunately, the gas pressure is of short duration and relatively small energy content, so that a good deal of this effect can be taken up in the elastic strain. The walls below first floor level should be especially designed to resist splinters.

In regard to the question of materials, to resist concussion, toughness, and flexibility with moderate strength is preferable to brittleness and rigidity with high (static) strength. This suggests the complete abandonment of brick and masonry construction unless it is cushioned in some manner, or has embodied in it a very tough interlocked metal reinforcement. The brick or tile wall panels which it is customary to use in steel or concrete framed buildings are objectionable in this respect and should be replaced with expanded metal connected to the frame, combined with a non-inflammable and somewhat flexible plastic. The whole structure should be in sub-divided units separately stable and with windows allowing bursting without injury to the frame. All heavy plant, furnaces, tanks with hot or dangerous liquid, should be on the ground floor.

To carry the matter to its extreme conclusion, the whole structure (roof and walls) might be covered with a layer, preferably sloping, several feet thick, of shock-absorbent material, such as sand or slag wool. The peculiar structural and economic problems involved need not here be elaborated, but are obviously very serious indeed.

It is estimated that 15-ft. thickness of concrete is required to resist the penetration of 500-lb. semi-armor piercing bombs, but various metal meshwork reinforcements are on the market which claim to reduce this thickness by about 50 per cent.

The improvement of old structures in fire resistance and strength is very difficult indeed. Gradual substitution of better parts may be a small palliative. Probably the best and most economic step is to put in a sprinkler system (for every floor) and reduce the quantities of inflammable furniture, etc., to a minimum. Extensive water tanks in the roof may be useful. As to strength, additional pillars and metal wall and roof ties should be put in wherever repairs will permit. All plaster ceilings should be replaced by continuous material which cannot fall in lumps.

To reduce the effects of splinters from external explosions all openings on the ground floor should be closed with walling up to 9-ft. from the floor. This will only slightly decrease the sky-lighting. Oblique mirrors to catch the light from the sky would enable skylighting to be recovered.

As far as structural damage from internal explosion is concerned, the use of maximum glass area with glass of a weight just adequate to resist ordinary weather effects provides a minimum hindrance to the free escape of the gas and so minimizes the structural damage.

It goes without saying that ample stairways (external and internal) of fire-resisting materials and protected from splinters are desirable. Chutes, firemen's sliding poles, ladders, hoists, or other means of rapid evacuation of occupants should be provided. Lift shafts should have closeable flaps, preferably at each floor, to prevent up-draught.

Protective Devices

In view of the prodigious costs of altering old buildings to increase their resistance and of constructing new ones in a manner which will give the highest attainable degree of resistance various protective devices will largely be used. The use of "sprinklers" has already been mentioned. Non-inflammable double doors, external and internal, and window shutters are also indicated. These are particularly useful to prevent the spread of fire. All ground floor openings should be able to be closed with sand-bags or earth-boxes up to 9-ft. above floor level.

The following further items should be mentioned in connection with the reduction of fire risks :—

(*a*) Fire buckets, in large numbers, kept full, and hose to reach all parts of the building.
(*b*) Chemical fire extinguishers, of the smothering or heat absorption types, if such there be.
(*c*) Sand-boxes.
(*d*) Noticeable, accessible, and easily controllable main cocks on gas mains and electric switches.
(*e*) Fixed fire guards and closed grates with closeable flue valves.
(*f*) Available ladders and tools for forcing access to enclosed spaces.
(*g*) Asbestos sheets for closing holes.

Structural damage calls for a liberal supply of planking, struts, shores, cement, and bricks for emergency repairs, with good supply of tools, cranes, etc., for same.

Technical skill can well be applied to many auxiliary devices.

Steel helmets, mail shirts, gas masks, asbestos overalls, and other personal safeguard form one group.

Non-splinterable glass, bomb-proof shelters, gas-tight joints for doors and windows, air locks, non-return ventilators, sanitary devices for use in gas-tight spaces, oxygen generators, carbon dioxide absorbers, fire extinguishing liquids in bombs or other containers, etc., provide endless scope for invention.

Collapse of Structures

The appropriate handling of structures that have been damaged is a very important aspect of the question. It appears to be the general practice for the first available labor to be used for the salving of life and property, but the authors suggest that experience in demolition and underpinning is so important that organized gangs of practised men should be prepared for such work. It cannot be too strongly emphasized that the improper removal of *débris* may easily cause further rapid collapse with further damage to life and structure, whereas experience in such matters and appropriate gear may enable the risk to be appreciably reduced. Many buildings are dependent upon those adjoining for mutual support and part of the measures required in handling such cases will include shoring or otherwise strengthening.

Thus public authorities might arrange with competent constructors to have men and equipment on call, with means of rapid transport, for dealing with such emergencies.

Gas Exclusion

The exclusion of poison gas from an enclosed space presents less difficulties than most other aspects of the question, reducing itself in principle to the closure of all openings by suitable materials and the provision of air locks for ingress and egress. It must, however, be observed that ordinary structures are by no means air-tight, so that special steps have to be taken to deal with doors, windows, pipes, flues, roofs, and ventilators. Inasmuch as all internal occupation of a building involves a steady inflow of fresh air to replace that consumed, which inflow ordinarily occurs through ventilators, flues, pipes, windows, doors or cracks, either the period of closure must be limited to that in which the unchanged air becomes unfit to breathe or special inlets for cleansed air and non-return outlets for stale air must be arranged. A healthy man requires 300 cubic feet or more per hour for proper ventilation, and as the allowance of space in a building per man is of the same order, this means that for healthy conditions the whole air in an occupied space should normally be changed at least once an hour. In emergency this rate can be halved. In actual fact the A.R.P. handbook No. 6 states that shelters with 75 square feet of surface area per head (=12-ft. floor area, or, say, 100 cubic feet per person) can be occupied for six hours, so that an ordinary building with its ordinary occupants might remain unventilated for perhaps eighteen hours. If, however, work is to proceed, ventilation must be supplied for closures of more than, say, two or three hours.

If the intake is from a high point (preferably with a filter) and the air is introduced and retained under a small pressure, the latter provides a further guard against poison gas, but makes the operation of air locks more difficult.

Control of Supply Services

Damage by impact or explosion followed by fire and injury to machinery demands an immediate control of all the electricity, gas, oil, fuel, water, and steam supplies, so as to prevent further damage.

This suggests that main switches and valves should be controllable from several points in emergency, and at least one such point should be remote. Gas or oil lines are specially important.

On the other hand, for fire fighting water supply is essential and for ventilation and lighting of passages electric current will probably be necessary and if possible, alternative supplies should be arranged.

The possibilities of heavy " surge " in public mains due to sudden short circuits within, say, a factory calls for special types of " reactor " devices.

Mechanical Plant

There is a great possibility for certain small machines in connection with A.R.P. Thus, portable pumps for air and water suitable for fire fighting, ventilation or decontamination, small cranes for lifting heavy *débris* and small lighting sets may prove of great value.

Since such units need to be independent of outside sources, they will ordinarily be oil driven and this introduces new fire hazards which call for protection. Any pipes, cables, or conduits for same should be protected in the best possible manner.

Economics

The economic aspect of A.R.P. has a great bearing on the extent of possible application, and its importance may be realized by comparing premiums for war insurance. In a sense it is war insurance, and whereas owners are quite agreeable to paying ¼ or ½ per cent on values for fire insurance, they are not unnaturally disturbed when the cost of A.R.P. threatens in increase capital costs by 25 or more per cent and to increase running costs by, say, five per cent because figures of this order will annul the average profits reckoned on the old basis. The tendency of A.R.P. must be to increase the cost of living, since a great deal of labor and natural energy is diverted to activities which are non-productive, except in the sense that they may enable other activities to continue production in time of war. They do not differ from armament expenses in this respect; in fact, they are defensive armament expenses and, like them, if paid for out of income, transfer buying power to the wage workers. If paid for out of loans, on which interest and amortization has to be later returned, they ultimately take buying power from the wage workers.

The great addition to prime cost is inclined to lead to a policy of accepting the hazard as being cheaper than the remedy. Probably few owners are willing to spend more than ten per cent extra in structural provisions or more than 2 per cent of gross costs in actual running precautions. This will be especially the case as long as A.R.P. is voluntary, since the costs become a penalty against the owner who spends them and in favor of the one who does not.

Flood Prevention and Other Hydraulic Problems in China

(Continued from page 195)

Tung Ting Hu and Po Yang Hu, have formed natural detention reservoirs. These and dozens of smaller lakes could have their capacity for storage increased considerably at an almost insignificant cost by raising the banks, etc. If any form of detention reservoir were provided which would reduce the required height of the dikes by only 1-ft., the result would be the saving of many millions of dollars in construction costs over the long stretches of water guarded by dikes.

Unfortunately, in recent years large areas of land from lakes useful for storage purposes have been reclaimed. All over China, man's struggle for land for crops, conflicting with the demands for space for river regulation by engineers, has been one of the difficulties connected with the country's hydraulic problems. The issue is as much one of administration as of engineering, just as it is along the Mississippi. In China the fight for space between the people and the river water has grown increasingly bitter. The population has steadily increased—it has roughly doubled in 150 years, in spite of emigration—pushing the dikes towards the river channels and lakes to obtain arable land, thus contracting the high-water flood and raising the flood level. In addition, the people have been driven to cultivate less fertile lands up the hills, thus creating worse run-off conditions during heavy rainfalls.

Napoleon declared that " war is simple, but simple is difficult." It is said that if money is available, man can now accomplish anything in the struggle against the forces of Nature. If man-power, industry, and tenacity of purpose can compensate for the lack of money, then the Chinese will, in due course, carry out gigantic hydraulic works. Nor is it unlikely that some of the financial difficulties will be solved, because many of the schemes can be shown to be profitable. When the present conflict is ended there will it is hoped, be some scheme of international co-operation for reconstruction in China, similar to that devised after the terrible devastation caused last century by the Taiping rebellion. The Chinese Maritime Customs service was then formed, and proved to be of immense benefit to China and foreign trade. An extension of its activities to organize the control of all of the inland waterways of the country would enormously benefit the great mass of the Chinese people. The terrible destruction now taking place over large areas of China is nothing new in the history of the oldest nation on earth. Always the people have gone back to the land, and, with amazing industry and perseverance, have rebuilt their social life. But there is now a factor never previously included in the work of reconstruction in China. It is the knowledge and experience of Chinese and foreign engineers. That is a dynamic influence that will have a profound effect upon economic and social developments in China in the not distant future. It will, in all probability, lead to the creation of civil engineering works of enormous magnitude that must enrich the people. It will increase the influence in international affairs of a peace-loving people—the most numerous race on earth.

Tokyo Has New Subway Link

Another Section of Projected 50-mile Underground Rapid Transit System Connecting Shimbashi and Shibuya is Completed

By *W. HARVEY CLARKE, Jr.*

Another important link in Tokyo's projected fifty-mile underground rapid transit system, designed to relieve heavy surface traffic congestion by facilitating transportation over long distances in a metropolitan area having a population of nearly seven million, was forged by the Tokyo Highspeed Railway Company on January 15 last, with the opening of the 6½-kilometer stretch between the Shimbashi and the Shibuya termini. Since October 18, 1935, when open-cut excavation was begun at Shimbashi, the total outlay for construction and equipment has exceeded 23 million yen.

The line, with seven stations along its course, is laid in 4-ft. 8½-in. standard gauge (1.435 meters) and is double tracked throughout on a roadbed of gravel ballasting, instead of concrete, in order to help reduce noise to a minimum. Due to the specific geologic character of the underlying earth formation about midway of its length, the parallel tracks approaching Akasaka Mitsuke from both directions were separated and run into the station on different levels. Two single-track tunnel structures resting one upon the other were built for the purpose.

More than fifty thousand commuters daily are expected to use the Shimbashi-Shibuya line and the future Shinjuku-Tsukiji line, for which preparations to construct are now being made. With a view to the temporary saving of some of the cost of completing the latter line, the company will link it with the present one by means of a kilometer-long shuttle from Yotsuya Mitsuke to Akasaka Mitsuke, forming a Y-shaped convergence of the two at the upper and lower level island platforms of this station. Every addition to Tokyo's underground transit system thus serves to bind the city's key points closer to its far-flung districts spread out over 214 square miles within corporate limits.

Tokyo Highspeed Railway's Executive Personnel

President - - - -	Chokiuro Kadono
Managing Directors	M. Waki Keita Itsushima
Director and Chief Engineer - - -	Shiro Kurokōchi
Directors - - - -	Kaichiro Nedzu, Tokutaro Inoyue, Yasuo Kanemitsu, Shun Wada, Kumao Anamidzu, Inau Ikebe, Gakuichi Toshimitsu and Michiro Shinohara
Heads of Office Staff	Joji Matsumoto and Toyotaro Kasai

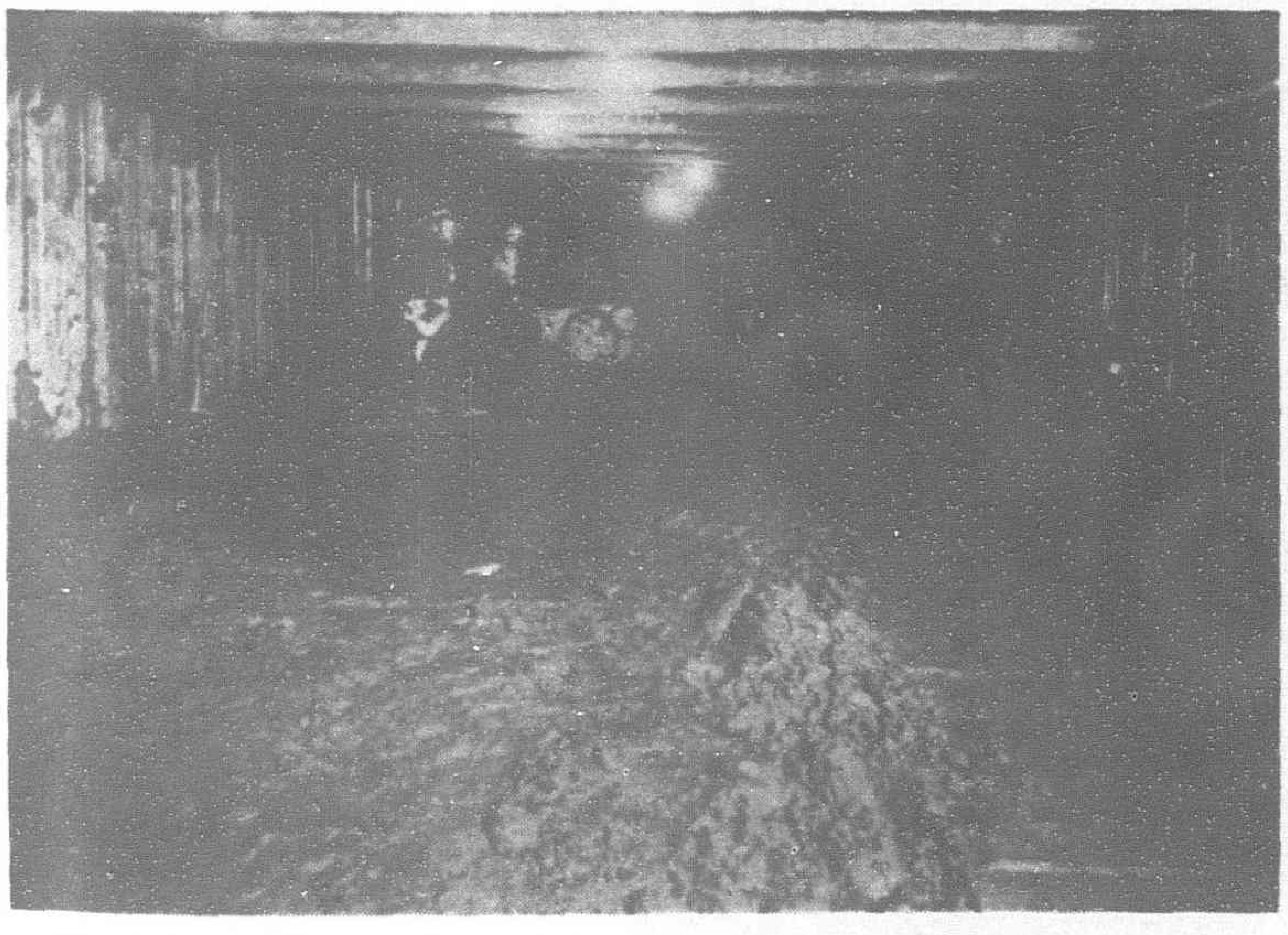
Established on September 5, 1934, with an authorized capital of 30 million yen—12 million of it paid up and derived jointly from suburban electric railway concerns and other Japanese financial sources, such as life insurance firms—the above company under a government franchise, obtained indirectly through the Tokyo Municipality, operates the new subway for which the cost of construction work alone aggregated 20 million yen, about Y3,070,000 per kilometer, or approximately five million yen a mile.

As thousands of commuters use the Shibuya Station, especially during the morning and evening rush hours, particular attention was given to simplifying passenger connection with the various surface lines coming into this station. Transfers can be made at Shibuya to the *To-yoko* (Tokyo-Yokohama), the *Teito*, the *Tama River* interurban electric railways and the government elevated belt line ; at Shimbashi to the Tokyo Subway Company's Asakusa line as well as the belt—and the *Tokaido* main lines. When work now under way for direct sub-surface connection facilities with the Tokyo Subway Company line is completed at Shimbashi, uninterrupted subway operation of more than fifteen kilometers from Shibuya to the Asakusa Park terminus will be effected.

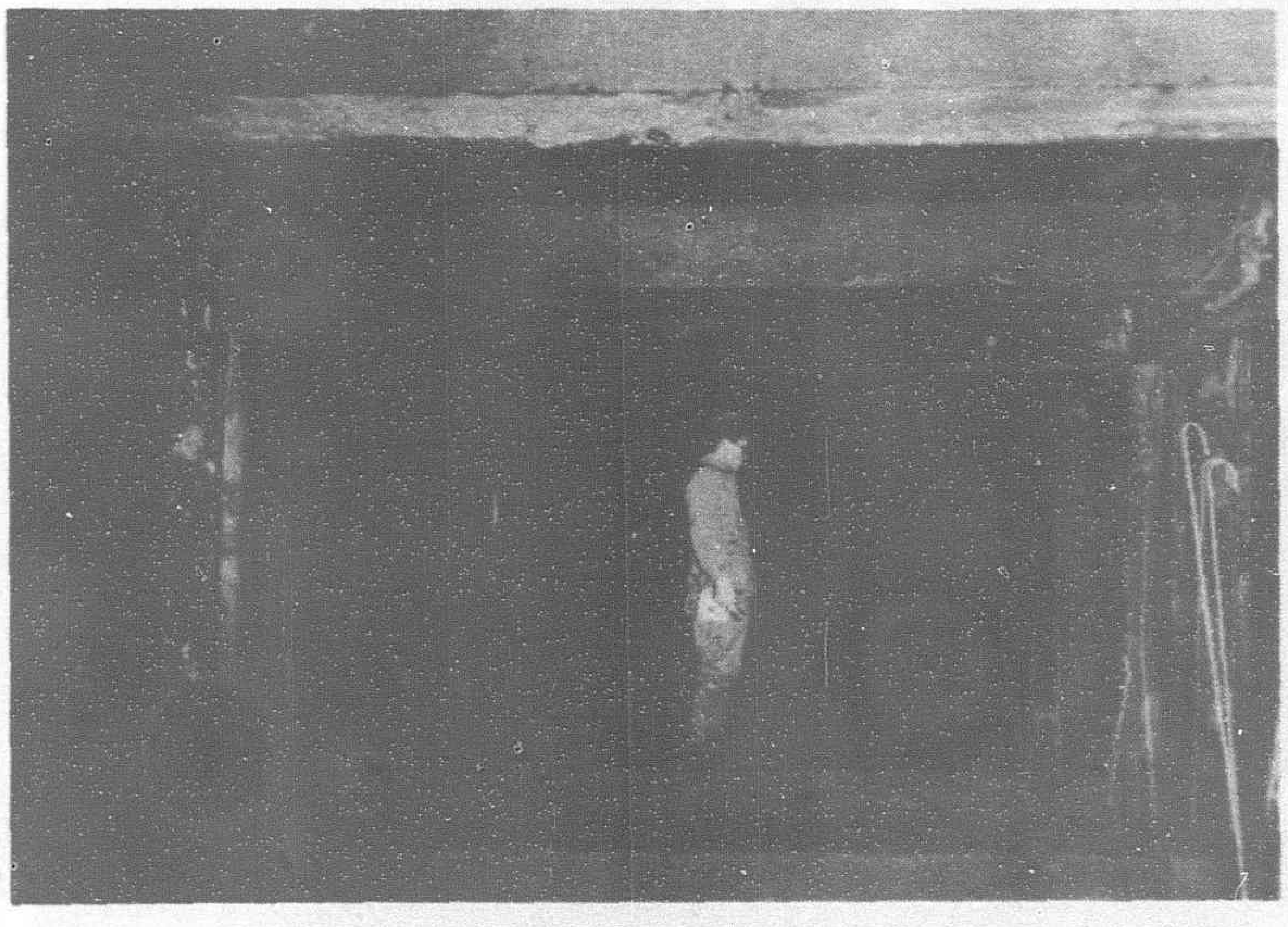
Subway lines some twenty years ago authorized by the government to be built in the city of Tokyo and those partly constructed and now being operated are :

(1) Line connecting Asakusa and Shinagawa via Shimbashi.
(2) Line connecting Meguro and Minami-senju via the Tokyo Central Station.
(3) Line connecting Shibuya, Shimbashi and Sugamo via the Tokyo Central Station.
(4) Line connecting Shinjuku and Otsuka via Tsukiji.
(5) Line connecting Ikebukuro and Susaki.

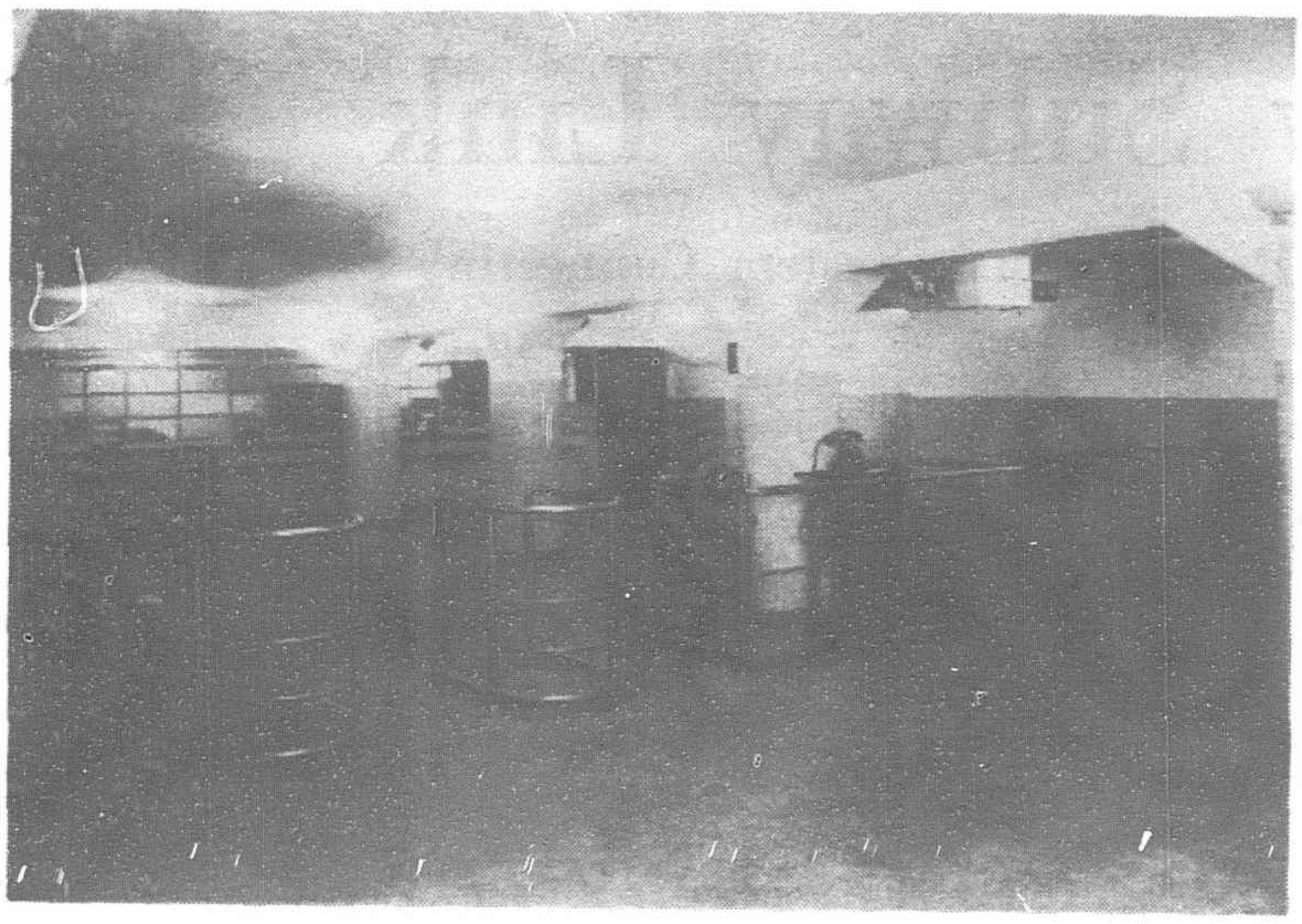
In 1918 the government authorized the Tokyo Subway Company to build the city's first underground railway to extend for thirteen miles from Asakusa to Shinagawa. About five and a



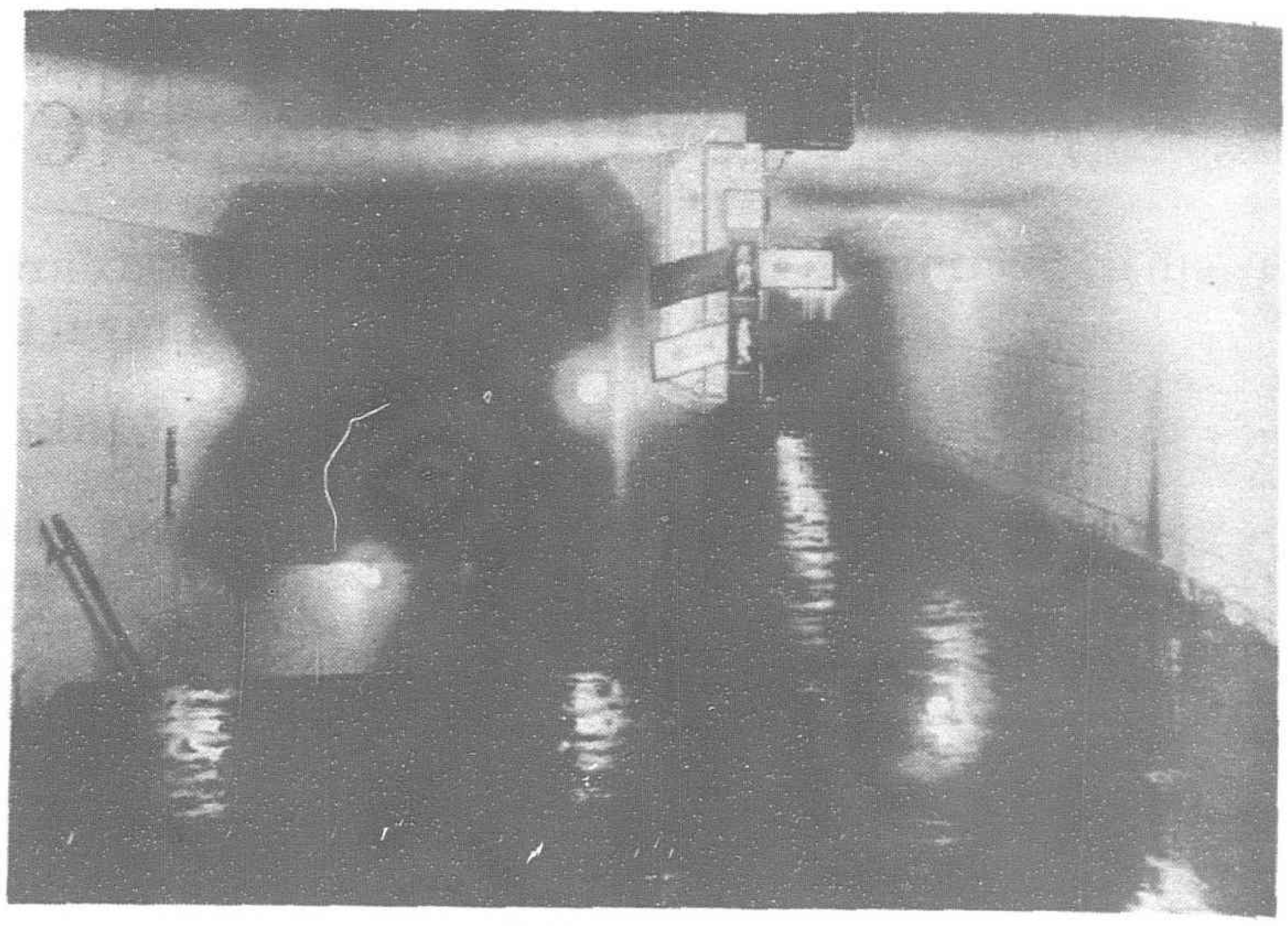
Sheet iron piles and steel beams aid in excavating between Shimbashi and Akasaka Mitsuke



In cut and cover excavating, the wooden strut beams and decking are two meters apart from centers. The wood is American white pine, and each section is 30 cm. square



Entrance at Aoyama 4-Chome Station



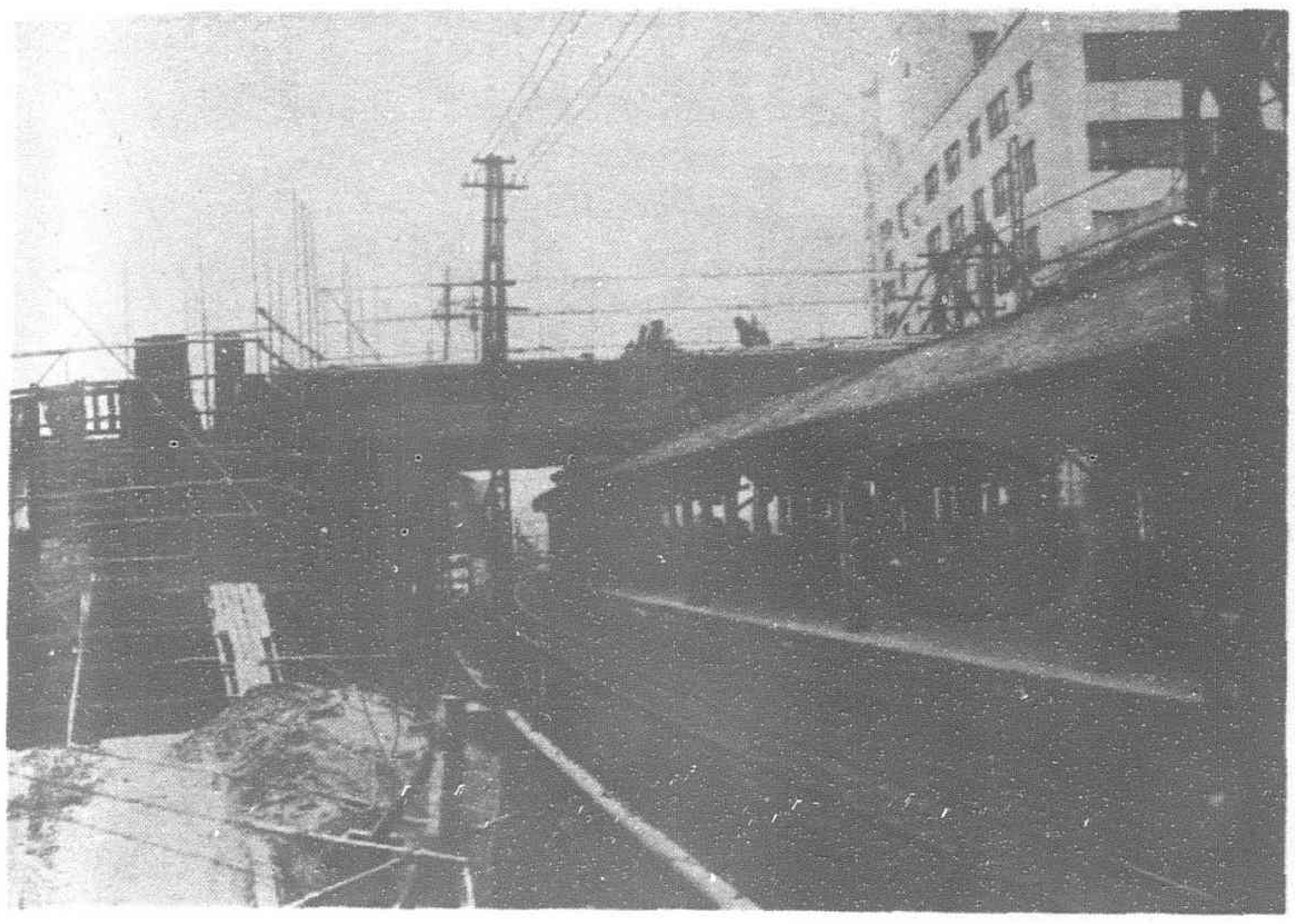
Entrance to two platform levels at Akasaka Mitsuke

half miles of this double-track route, the Asakusa-Shimbashi section linking twelve stations, has been in operation since June 21, 1934. At the same time the municipality of Tokyo was empowered to construct the other four lines designated.

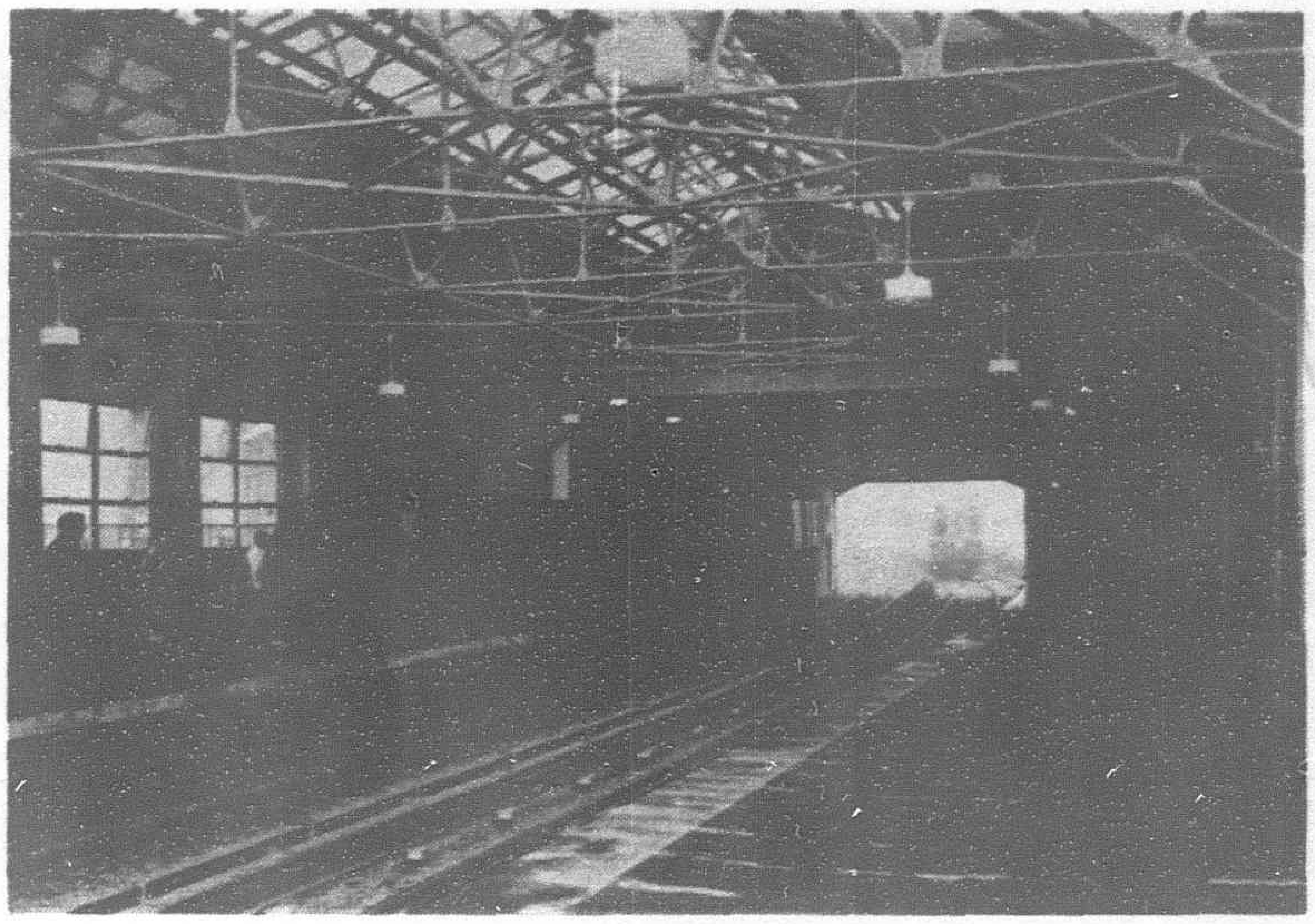
Notwithstanding the imminent need for more and faster means of transportation within the city, years passed with no definite action for building having been taken by the municipality until, in 1934, the Tokyo Highspeed Railway Company sought from the city fathers the right to begin construction on all or some of the remaining four lines. Ere long, permission was forthcoming, and the newly organized company was granted the right to build parts of the third and the fourth lines listed above, thereby being enfranchized to construct subways from Shibuya to the Tokyo Central Station via Shimbashi on the third line and from Shinjuku to Tsukiji via Yotsuya Mitsuke on the fourth line.

Sidewalk entrance to the Toranomon Station

Entrance to the Akasaka Mitsuke Station



Shibuya Station under construction. Lower platform and track is for the Government belt line



Subway train about to enter Shibuya Station on elevated section after leaving tunnel

The Tokyo Highspeed Railway Company, consequently, has undertaken to complete two subway trunk lines and one shuttle, as follows:

- (*a*) Shibuya Line—connecting Shibuya and the Tokyo Central Station via Akasaka Mitsuke and Shimbashi, a distance of about nine kilometers.
- (*b*) Shinjuku Line—connecting Shinjuku and Tsukiji via Yotsuya Mitsuke, Kojimachi and Hibiya, a distance of about seven kilometers.
- (*c*) Shuttle Line—between Yotsuya Mitsuke and Akasaka Mitsuke, a distance of about one kilometer.

In many of the world's big cities capital raised for local passenger transportation is derived largely from municipal sources, there being a tendency to let some portion of construction and equipment expenses fall upon city revenue, and indirectly upon those whom the facility serves. But Tokyo is unique in having attempted from the start construction of the latest type of subway system solely through private investments without government subsidization, such as the London tube has had.

The nature of the soil along the Shibuya-Akasaka Mitsuke section, covering about four kilometers, is firm clay stratum with some traces of sand near the ground surface, while lower levels show Tertiary formations of hard clay, sand and shale containing only a small quantity of water. Here excavation progressed with comparatively little difficulty. From Akasaka Mitsuke to Shimbashi, however, underground formations consist mostly of coal-like and disintegrated clay. Work along this section was therefore much delayed.

The general method of construction adopted for this line was consistently the same as that used by the Tokyo Subway Company in putting through the Asakusa line several years ago—that is, the open-cut and covering with supported American white pine decking, each piece of timber measuring 25 to 33 centimeters square, laid across the surface of the excavated area.

At intervals of one and a half meters, steel I-beam piles were driven where the geologic structure was sufficiently firm to permit. But along a distance of 1.4 kilometers between Akasaka Mitsuke and Shimbashi, sheet iron piling and beams were used. The piles measure 15 meters wide by 18.5 meters long. It was the first time such a procedure for subway construction had been employed in this country. All of these sheet piles were produced by the Japan Iron Manufacturing Company, whose type three piles were used.

Inside view of Aoyama 6-Chome Station

Appreciable sinking of the street surface being inevitable when excavating in front of sizeable buildings took place, digging in such instances was carried on by first erecting concrete columns as supports before excavation was taken deeper. Near Shimbashi Station at a depth of eight meters the ground began to rise. To check this movement, holding concrete posts were sunk, and excavation was continued by breaking through the concrete.

Where the line meets the present Tokyo Subway terminus beneath the wide elevated bridge structure of the government main line at Shimbashi, trusses to support the bridge while construction was under way were set temporarily upon a base below the floor level of the tunnel.

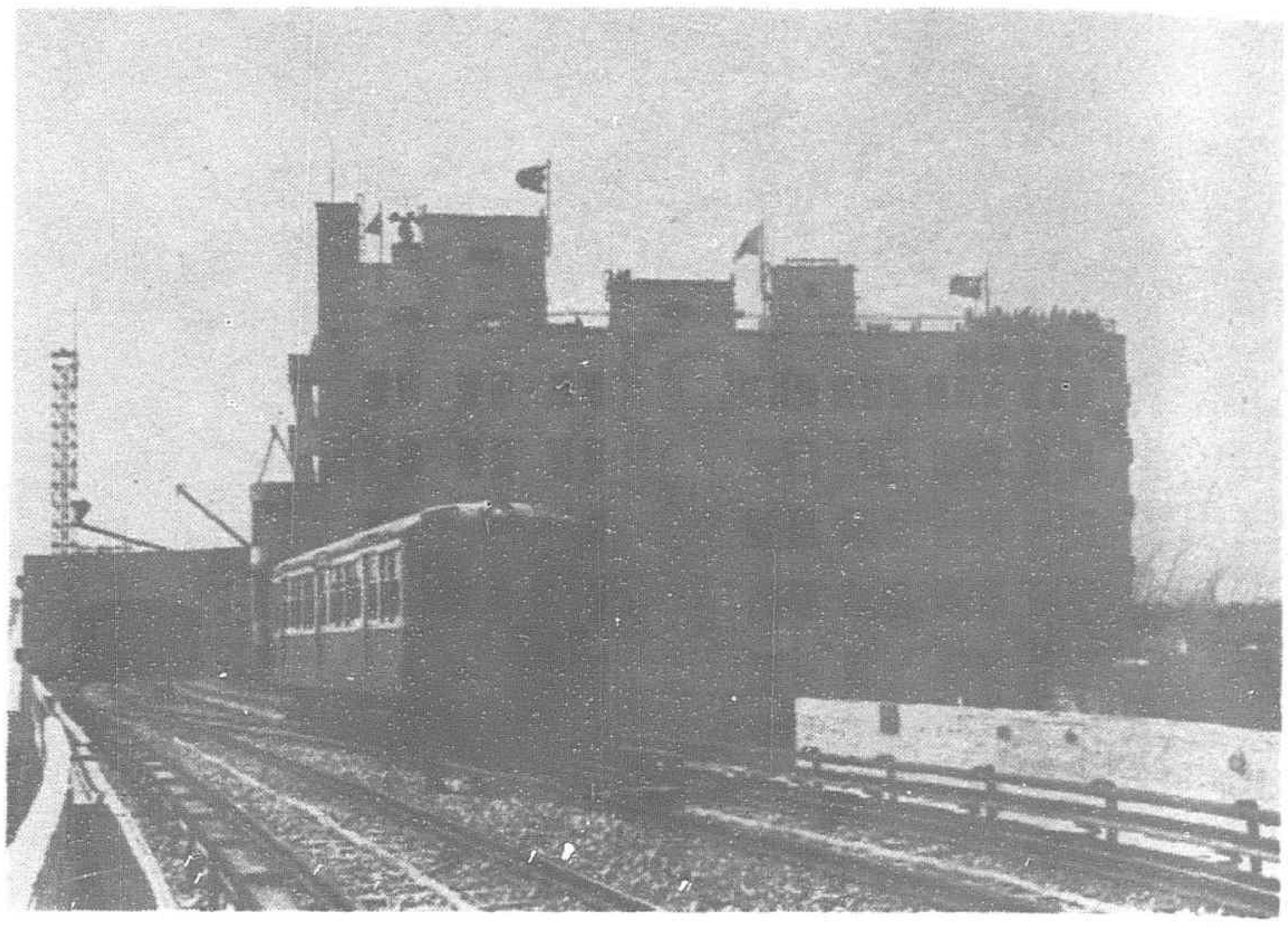
Salient Features

1. As a means to supplement natural ventilation, which is provided along most of the line, mechanical ventilating equipment was installed between Toranomon and Akasaka Mitsuke. Suction fans are operated in separate rooms for the cleansing of foul and the intake of fresh air into the subway structure.
2. Draining of water seepage is done by pumps.
3. Sound reduction of train noise is effected by means of track ballasting with small gravel.
4. All lighting is semi-indirect.
5. The six and a half kilometers between Shimbashi and Shibuya is covered in thirteen minutes flat, including stops at five way stations.
6. Stations are of ferro-concrete, box-shaped construction, and the tunnel structure is single posted, its size being almost the same as the Tokyo Subway tunnel, so as to enable underground connection at Shimbashi.
7. The elevated section at the Shibuya terminus is ferro-concrete and double tracked. It has a fixed end and is a triple-serial, 3-span structure of *torii* type, each span measuring about seven meters across.

More Details

1. Length of main line—single tracks 6.478 kilometers; double tracks 13.206 kilometers.
2. Length of sidings 1.141 kilometers.
3. Length of tunnel structure 5,969.362 meters.
4. Length of elevated section 498.2 meters.
5. Length of semi-surface section 229.3 meters.
6. Track gauge 1.435 meters (4 ft. 8.5 in.).
7. Maximum gradient 3.3 per cent (one in thirty-three).
8. Minimum curve radius 150 meters.

Side platform at Toranomon Station. Each station has different colored tile walls to make for quick identification



Part of elevated section and approach to Shibuya Station. Platform level is on third floor of station and department store building

(9) Rails—main line 50 kilograms; siding 30 kilograms.

(10) To eliminate objectionable odor, the wooden ties are not chemically treated.

(11) The three main stations are at Shimbashi, Akasaka Mitsuke and Shibuya, with intermediate ones at Toranomon Aoyama 1-chome, Aoyama 4-chome and Aoyama 6-chome.

(12) An upper surface contact third rail carries 600-volts d.c.

(13) Wires conducting electric current for the third rail are of 37 and 50 kilogram weights. The ports are heavily insulated.

The line has two power substations, the Akasaka substation at 1-11 Tamachi, Akasaka Ku, and the Shibuya substation at 36 Kinnomachi, Shibuya Ku. Power is supplied by the Tokyo Electric Light Company, as follows:—

Akasaka	Substation 3,000 kw. d.c.
Shibuya	Substation 1,500 kw. d.c.

The four 50-cycle transformers at the two substations are identical. There are two for ordinary and one for reserve use at Akasaka and one for ordinary use at Shibuya. Their capacity and pressure are: 2,020 kva, and first stage 22,000, 21,000 and 20,000-volts; second stage 560-volts.

Rolling stock consists of thirty bogie type steel coaches, each weighing 38 metric tons, with seating accommodation for forty and standing room for eighty passengers. They are 16 meters long and 2.55 meters wide. The car shed is located at 53 Owada, Shibuya Ku.

SOME DETAILS OF THE SHIMBASHI-SHIBUYA SUBWAY CONSTRUCTION

Work	*From*	*To*	*Distance in kilometers*	*Work begun*	*Contractors*
1st Stage	Shimbashi	Toranomon	1.167	Oct. 18, 1935	Railway Ministry and Okura Civil Engineering
2nd Stage	Toranomon	Akasaka 1-chome	1.350	May 12, 1936	Kashima Gumi
3rd Stage	Akasaka 1-chome	Aoyama 4-chome	1.930	Mar. 3, 1936	Hazama Gumi
4th Stage	Aoyama 4-chome	Miyamasuzaka	1.600	Dec. 6, 1935	Okura Civil Engineering
5th Stage	Miyamasuzaka	Owada (Shibuya)	.420	Mar. 1, 1937	Kashima Gumi and Ando Gumi
		Total	6.467		

RAW MATERIALS USED IN CONSTRUCTION

Okura Civil Engineering:

1st stage (from Shimbashi to Toranomon)

4th stage (from Aoyama 4-chome to Miyamasuzaka)

Iron framework	5,225 metric tons
Structural steel	8,841 metric tons
Gravel	10,347 cubic *tsubo*
Sand	6,583 cubic *tsubo*

Kashima Gumi:

2nd stage (from Toranomon to Akasaka 1-chome)

Iron framework	3,500 metric tons
Structural steel	8,000 metric tons
Gravel	5,000 cubic *tsubo*
Sand	3,000 cubic *tsubo*

Hazama Gumi:

3rd stage (from Akasaka Shimmachi to Aoyama 1-chome)

Iron framework	3,300 metric tons
Structural steel	3,600 metric tons
Gravel	6,000 cubic *tsubo*
Sand	3,500 cubic *tsubo*

The Shimonoseki-Moji Undersea Tunnel

Work on the undersea railway tunnel between Shimonoseki and Moji which has been under way since July, 1936, entered its main stage in January when the "shield" system of excavation was adopted for a section of 1.3 kilometers 27 meters below sea-level.

Up to the present, the tunnel has been dug only to a point 100 meters from the Deshimachi entrance on the Shimonoseki side. A subsidiary tunnel, 2.7 meters high, which has been under construction seven meters below the main tunnel, will be completed next July. It has been excavated 400 meters from the Shimonoseki and 380 meters from the Moji side.

Under the "shield" system, an iron tube seven meters in diameter and 21 meters in length will be driven by compressed air to open the tunnel. Due to the high air pressure in the tunnel, workers will be unable to remain in it more than two hours. The method which was employed in excavating the tunnel under the Hudson River in New York will be first used for the Shimonoseki-Moji tunnel. The engineering work will be completed by Japanese technicians and workers exclusively, without the help of foreigners. The iron "shield" which has been under construction was completed late in January.

The tunnel will be completed in 1942 at a cost of Y12,000,000. Shimonoseki Station will be moved and set up at Osato, near Moji, and new premises will be provided at Hatafu, near Shimonoseki, for forming wagon trains, at a cost of Y23,000,000, until completion of the tunnel.

At present, only from 500 to 700 carriages and wagons can be transferred between the Shimonoseki-Moji Strait by five railway ferries. Following the completion of the tunnel, the Railway Ministry will build another undersea railway tunnel to parallel it at a cost of Y10,000,000. It will connect with the proposed Tokyo-Shimonoseki broad-gauge line.

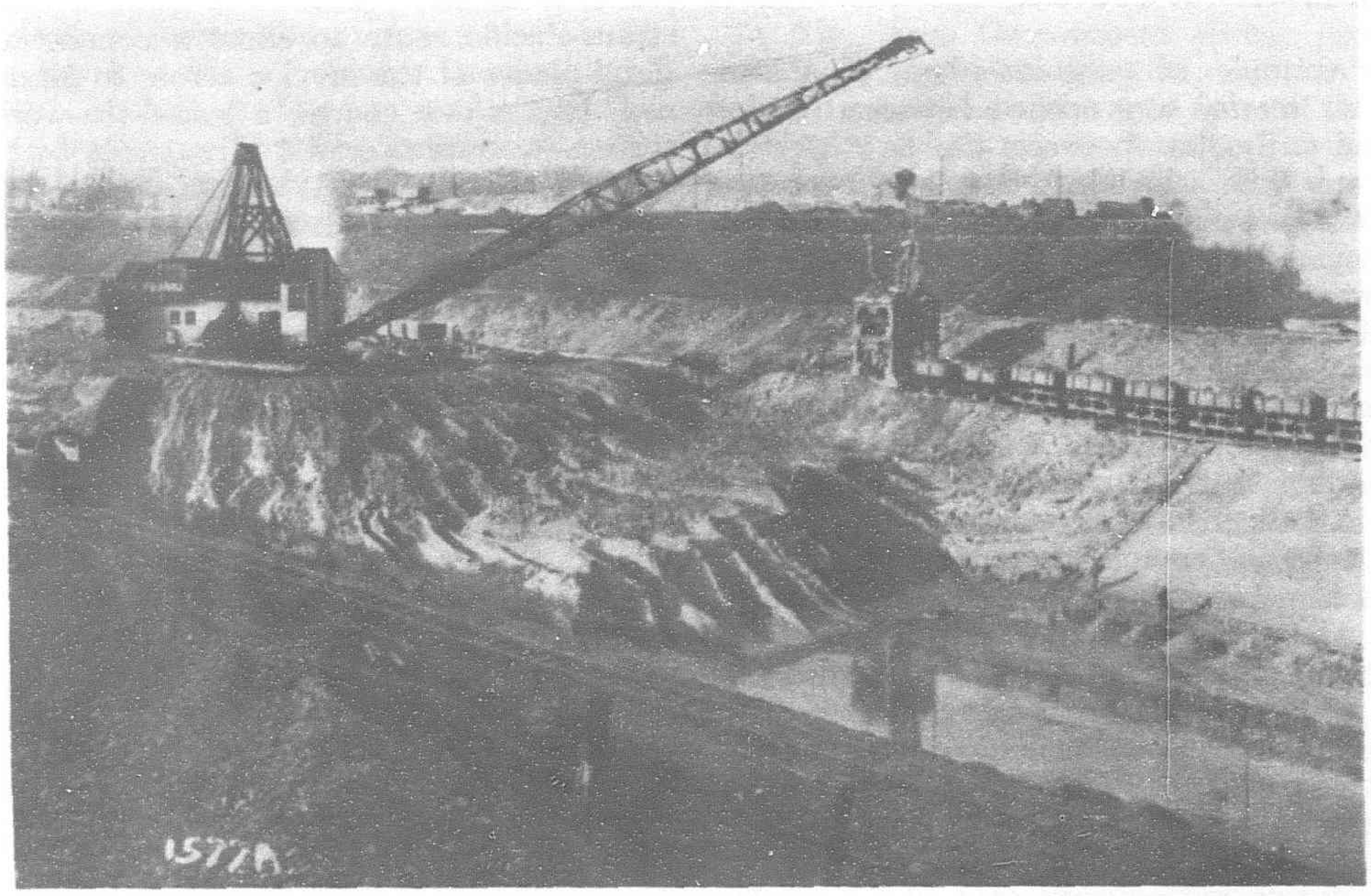
Ruston-Bucyrus Monighan "Walking" Dragline

MESSRS. Ruston-Bucyrus Limited, Excavator Specialists, Lincoln, have added a very interesting and useful dragline excavator to their already extensive range of excavating machinery.

The machine known as a Bucyrus-"Monighan" Walking Dragline is extensively used in America upon the Mississippi Levee Construction Schemes; for stripping mineral deposits in open cast mines; upon drainage and irrigation schemes and excavating large sand and gravel deposits.

Messrs. Ruston-Bucyrus Ltd. are distributors for the Bucyrus-Monighan Company in the Eastern Hemisphere and in this connection have sold a considerable number of these machines for use in Nigeria, Malaya and upon the Continent. They have met with such success that steps have been taken by Ruston-Bucyrus Ltd., to obtain the manufacturing rights of the most popular size of machine, known as the 5-W, and an order has been received for a machine of this size from the Stanton Ironworks Co., Ltd. This machine will be used for stripping and digging ironstone in one of the many ironstone mines owned by this Company.

With the exception of the electrical equipment which will be supplied by the B.T.H. Co., Ltd., of Rugby, the machine will be manufactured throughout at Lincoln.



One of the machines, 6-W size at work on the Albert Canal in Belgium where it has been in action five years

The title of "Walking" Dragline arises from the novel travelling device with which the Bucyrus-Monighan machines are exclusively fitted in place of the usual caterpillar tracks or wheels. The walking action is obtained from huge feet or rafts which are fitted to the machine, one on each side of the revolving frame operated from large cams attached to the superstructure.

When the machine is in operation the superstructure rotates upon a big circular base, which upon the 5-W is 24 feet in diameter. This base rests flat upon the ground and, because of its big area the bearing pressure upon the ground is 5-lb. per square inch, i.e. no more than that exerted by a man walking. This is only about half the pressure exerted by the caterpillar tracks of small excavators and less than one-third of that of large machines.

When the machine is operating, the large rafts or shoes swing clear of the ground. When it is required to move the machine the walking machinery is set in motion and the two shoes are simultaneously lowered on to the ground by means of large cams and the weight of the machine is transferred from the base to the shoes. As the cams continue to rotate the complete machine, exclusive of the shoes, is lifted and moved forward with a sliding motion, a distance of about six feet until the base again settles down on to the ground. A complete rotation of the cam constitutes one step. The operation can be repeated *ad lib* in steps of six feet.

A very important and useful feature of the device is the fact that it enables the machine to "step off and walk" in any desired direction by simply swinging the superstructure to point in the direction the machine is required to travel.

Another useful feature of the machine is its low center of gravity due to the absence of caterpillar tracks or wheels under the base. The 5-W model weighs 135 tons and is available for either diesel or electric power.

Booms from 60 to 140 feet long are fitted with buckets from six to three cubic yards capacity, the size depending upon the length of boom used. The machine on order for Stanton Ironworks Co., will be fitted with a 135 foot boom and a three cubic yard bucket. It will be electrically operated by means of the Ward-Leonard system of control which the Ruston-Bucyrus Company use successfully on their Quarry type shovels and large draglines.

It is interesting to note that the largest machine in the Bucyrus-Monighan range weighs 1,200 tons and will carry a boom 250 feet long. We are able to reproduce an interesting photograph of a 6-W size of machine sold by Ruston-Bucyrus Limited. It is seen at work upon the Albert Canal in Belgium. This machine has been working with great success for over five years on this job, working for most of its time 24 hours per day and has dug about three million cubic yards.

The Cotton Industry in North China

(Continued from page 198)

information regarding these stations was available under such conditions but with the coming of the Japanese anything that can still be used is being put in order. Before long the former stations will be in working order again.

The above related policy of the Government to increase cotton production is presently marking time, awaiting the full adjustment of the encouragement organs and institutions but upon their completion the Plan will be pushed enthusiastically to the limit. From the very beginning the Japanese nation has given substantial assistance toward the materialization of the Plan. The Ministry of Overseas Affairs purchased in the spring of this year 1,000,000 *chin* (a load for 68 freight cars) of improved Chosen upland cotton seeds and through the Provisional Government distributed them free of charge to North China farmers. In addition experts and instructors have been sent to North China and Chinese employees are being given training in the field. In truth the Japanese are giving all the assistance and help that they can give. On the other hand the Peking Provisional Government is doing its part, if not more. Fully realizing the importance of cotton, it is contemplating the creation of a central organ to deal with everything that has to do with cotton, and to entrust to this organ the work of promoting and encouraging cultivation, experimenting, and the purchasing of produced cotton. Of course separate organs will take care of the functions just listed, but they will be incorporated in the speedy central organ. All these activities will help to bring about the realization of the large scale cotton production program which all circles concerned have placed much interest and expectation.

Round-the-World Air Travel

By ROBERT BRENARD

WHEN, just recently, the hoarding was removed from the front of the new Imperial Airways headquarters in London, it revealed a special group of statuary which symbolizes speed in flight. And it was this new speed era which was illustrated, not long ago, when one of the new class express-planes of Imperial Airways aircraft—the fastest four-motored aircraft now in use on the European air routes—flew from London to Paris in only 53 minutes; while it may be remembered that another craft of the same class, operating on the Brussels route has set up a new commercial air-speed record by covering the 200 miles between Croydon and Brussels at an average speed throughout of 250 miles an hour.

And here is another example of progress when, soon after the Great War, the first air service was opened between London and Paris, only one 'plane daily flew between the two capitals. But this year, when summer-time schedules come into operation shortly, there will be as many as eight departures in each direction daily by the service to be operated jointly on this route by Imperial Airways and British Airways.

One of the features of the new Imperial Airways headquarters in London will be its spacious booking-hall. And here passengers will buy tickets not only for swift flights over the European airways, but also for long-distance voyages across the Empire flying routes. And experts are now reckoning that, far sooner than some people think, it will be possible to walk into this great booking-hall and obtain a ticket which will take one completely round the world by air, each stage being flown in a big flying-boat or land-plane of an inter-connected Imperial system. Already there is the great 13,000 miles route through from England to Australia; and soon this is to be augmented by a 1,400 miles service on from Australia to New Zealand. Early this summer, too, we shall have the establishment of a regular 3,200 miles service stretching from Southampton (England) to Montreal (Canada). This will give the Empire 4,600 miles of new flying-boat routes. At Montreal the North Atlantic service will connect with land-plane expresses operating for 2,600 miles across Canada to Vancouver. It is these new routes, added to the existing England-Australia service, which will enable Empire aviation to operate an inter-connected air system stretching for 20,000 miles across the Empire from Auckland in New Zealand to Vancouver on the Pacific coast of Canada.

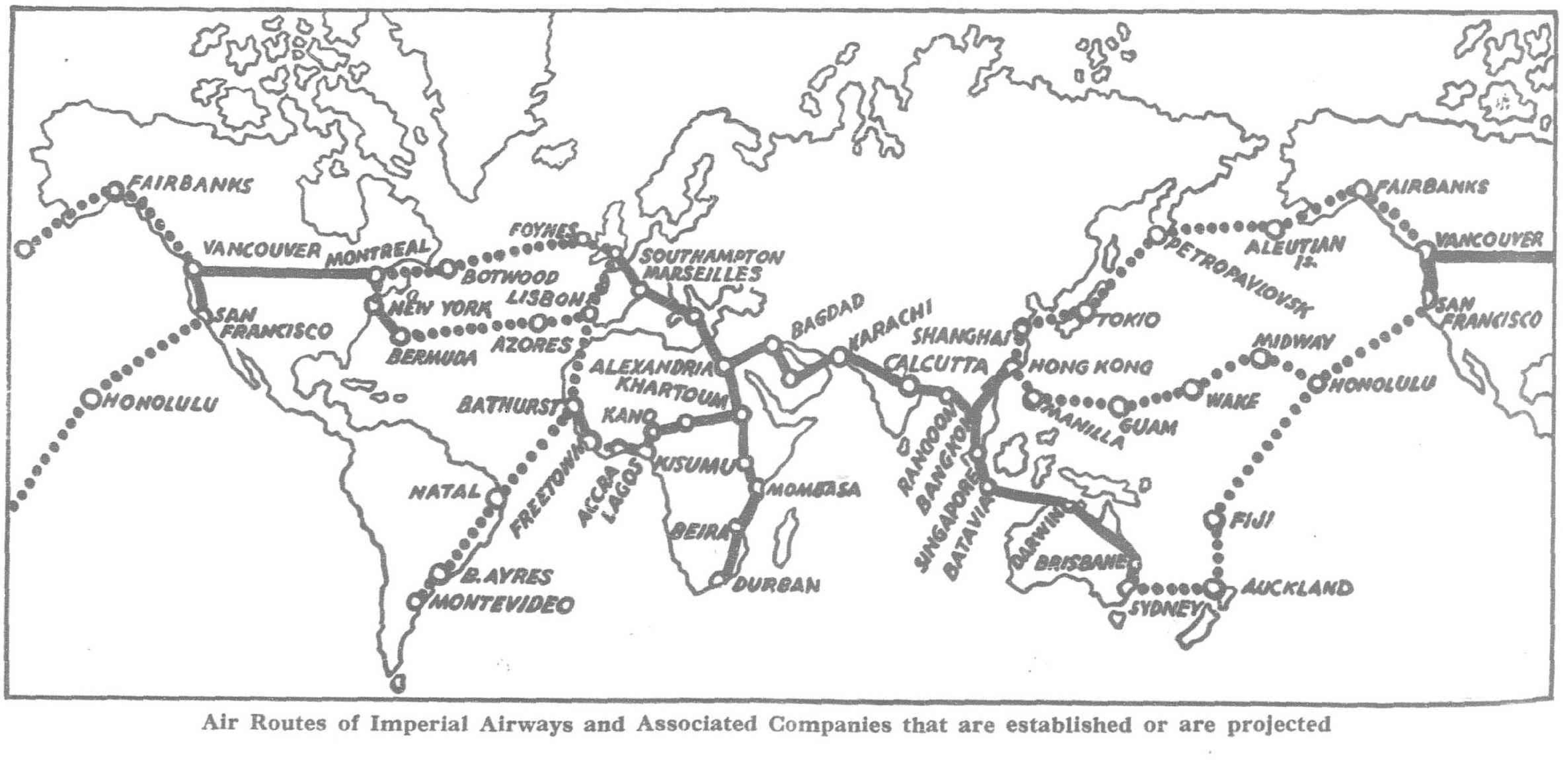
This leaves Imperial Aviation with the task of forging, in suitable stages, a route of approximately 8,000 miles which will cross the Pacific between New Zealand and Vancouver. Here the first necessary steps are already being taken. Surveys and investigations are actively in hand. Schemes are being worked out for the establishment of special wireless and meteorological organizations. The first air link proposed is one of 1,300 miles. This will take the Australia-New Zealand route on from Auckland to Fiji. After this will come a Fiji-Honolulu section. This will extend over 3,000 miles. Following this will be the stage Honolulu-San Francisco, a distance of approximately 2,300 miles. And after that yet another link—this time of 960 miles—will complete the route from San Francisco to Vancouver. And this will enable the trans-Pacific route to effect a connection at Vancouver with the land-planes of the service across to Montreal.

So, in due course, a round-the-world air line will come into being—a route operated throughout by great air liners of an inter-Imperial service.

The work immediately in hand, with new aircraft and specially-trained crews is the establishment of the new North Atlantic and trans-Tasman services. For the operation of these services seven big new flying-boats are now being made ready. Four will be allocated to the North Atlantic, and three to the Tasman services.

It is the crews for these sea and ocean craft, selected from the skilled personnel already flying on the Empire routes, who are now undergoing a special form of training at a "school" at the Southampton air-port. One of the features of this special training is that the members of these crews frequently plot out imaginary voyages across sea and ocean routes. Such "flights of fancy" are worked out in every detail, and though during such tests these men do not stir from their room overlooking Southampton Docks they are, in their mind's eye, far out somewhere above sea or ocean. In these theoretical air voyages every allowance is made for prevailing wind and weather, the idea being to plot out a course which will, so far as possible, avoid any storm centers which may be seen to be approaching or lying across the chosen route; and also—and this is very important—to take every possible advantage of favoring winds.

Years ago, when pioneer airmen were facing the perils of the first trans-ocean flights, they had little they could rely upon but their own intrepid courage. To-day, things are very different. Every aid of modern science is at the disposal of the long-range flier, while he himself is an expert in many directions besides the handling of his machine. For one thing, he has to know all about



Air Routes of Imperial Airways and Associated Companies that are established or are projected

those powerful engines which will drive his big flying-boat across the sky. And he needs to be a mathematician as well as an airman. He must know all about spherical trigonometry. He must be familiar with the heavenly bodies. He must know the stars by name. To-day, in fact a long-range flier must be able to steer his course—just as a master mariner does—by celestial observations. Of course an ocean air pilot has wireless stations to co-operate with him in radio direction-finding. But in addition to this, when on any long ocean flight he checks his calculations by astronomical observations, being provided with a type of bubble sextant which has been evolved specially for aerial use.

It is to simplify the making of these celestial observations while moving rapidly through the air, that each new long range flying-boat is being fitted with a special form of transparent retractable navigating dome. This dome, when it is raised into position above the level of a flying-boat's hull, protects the navigator while he is making his observations from the slip-stream caused by the craft's swift passage through the air.

So, in addition to his actual piloting of an ocean aircraft, the flying-boat captain of to-day has to be engineer, meteorologist, radio expert and navigator. Actually he has now to do more than that, because he has now to familiarize himself with the new system by which long-range flying-boats will be fuelled, while in the air, from special tank-planes manoeuvring above them. The flying-boats to be used this summer on the North Atlantic are all equipped for this new fuelling system. The method will be as follows. One of the special tank-planes—big bombers adapted for this particular purpose—will get into position exactly above the flying-boat which is to be fuelled. Then a special pipe-line will be lowered from the tanker and will be secured by a member of the flying-boat's crew located in the tail of the flying-boat. Drawn in by a special winch, this pipe-line will be attached to the tank which is to be filled. Then—while still manoeuvring above the flying-boat—the "tanker" will feed down the requisite amount of fuel. This method is one among several which are now being tested with a view to increasing the load-carrying capacity of aircraft when engaged on long non-stop flights. Another method is that embodied in the successful Short-Mayo composite aircraft. This aircraft is, it may be remembered, really two machines in one, comprising the big mother-craft "Maia" and the long-range seaplane "Mercury"—the latter being mounted on "Maia's" wing. After the two craft have ascended together as one machine, "Mercury" is launched from "Maia" and proceeds in free flight. And it was this system which last summer gave "Mercury" the distinction of being the first heavier-than-air machine to cross the North Atlantic carrying a definitely commercial load in addition to its crew and feul—this load being represented by approximately half-a-ton of films, photographs and newspapers.

Japan's Economic Position in 1938

(Continued from page 180)

sharply from 20 per cent to about 16 per cent. Japan's import excess in trade with the United States amounted to about Y440,000,000, or only 23.5 per cent below that for 1937.

Every important export category and most major import items were affected by the widespread trade contraction. The principal percentage declines in exports to the United States, according to value, were : vegetable oils, 72 ; cotton textiles, 93 ; silk textiles, 30 ; rayon textiles, 62 ; knitted goods, 80 ; hats and caps, 62 ; toys, 63 ; marine products, 49 ; and raw silk, 12.2. On the other hand, sales of American raw cotton fell off by 51 per cent, tobacco 81, pulp 67, lumber 67, synthetic colors 84, iron and steel 66, and scrap iron 56.

The increased demands made upon Japan's financial structure were apparently successfully met, largely because Government and private financial institutions functioned smoothly and co-operated closely. Normal capital requirements of domestic business and agricultural enterprises were not greatly curtailed, and, in addition, it was necessary to raise huge sums to cover the Government's budgetary deficit, which was greatly increased by military outlays, and to provide funds for the manufacture of munitions and for expansion of productive power.

Indicative of the nation's financial contribution, over Y6,000,000,000 of bond and stock subscription payments were made during the year, of which Y3,668,000,000 represented purchases of national bonds (or 84.5 per cent of the total amount of national bonds issued). Well over Y4,000,000,000 was advanced for financing new enterprises, principally industrial. In order to offset these large investments and outlays, the Government endeavored to promote a thrift campaign with the object of inducing the public to save Y8,000,000,000 during the year. Complete data on the amount saved are not yet available, but it is known that over Y680,000,000 was added to the postal savings accounts of the Ministry of Finance's Deposit Bureau. Furthermore, bank deposits showed a considerable increase, along with bank loans and security holdings. The money market remained calm and easy throughout the year in spite of the extremely heavy movement of funds.

Note Issue Advanced—Bond Issues Increase

The large Government deficit produced certain inflationary effects, but tendencies in this direction were curbed by the various control measures. The note issue of the Bank of Japan amounted to Y2,858,000,000 at the year-end, or Y459,000,000 above the level recorded at the end of 1937. The year-end figure, however, was far above the average for the year, and when the large amounts of Bank of Japan notes held in the reserves of the Bank of Chosen and the Bank of Taiwan and in circulation in China are considered, it does not seem that there has been any great degree of inflation so far.

The general accounts budget for the year April 1, 1938, to March 31, 1939, was set at Y3,514,522,000, inclusive of three supplementary budgets. In addition, Y4,850,000,000 was voted for special military expenditures. Of the latter amount, however, Y318,301,000 was to be transferred from the general accounts. The greater part of these outlays was to be derived from bond issues, Y1,008,062,000 being authorized under the general accounts and Y4,453,490,000 under the special military account. As a result of these heavy borrowings, the Government's bonded indebtedness increased by Y4,329,000,000 during the calendar year 1938, and amounted to 16,222,700,000 at the end of the year.

Foreign exchange rates were well maintained throughout the year, the selling rate on sterling was maintained at 1s. 2d., and the yen-dollar rate, ranging between \$0.29⅛ and \$0.27, varied only in response to changes in the dollar-sterling rate. This stability was achieved, however, only through a very strict exchange and import control system coupled with continued heavy exports of gold.

Australian Iron for Japan

The Australian Commonwealth Government propose to take a firm stand to enable the completion of a private contract for the sale of pig iron to Japan. The Port Kembla waterside workers refused to load the pig iron, but the strike was settled on January 21. After the Cabinet meeting the Prime Minister, Mr. Lyons, said that he was unable to agree, to the request of the waterside workers' unions for a complete export ban.

The Government (he said) were compelled to view the position from the widest national aspect, including the effect on other industries and all Australian interests, of any interference with the ordinary flow of trade. In the present unsettled state of the world the action suggested by the unions might be fraught with grave consequences. The Government were not prepared to impose sanctions, except in conjunction with other countries.

In the past months the supply of pig iron had overtaken the demand, and the Kembla furnaces could double the output of pig iron, which was a highly finished product, the manufacture of which created widespread employment, whereas iron ore, the export of which was banned, was a raw material, and its retention conserved employment. The export of pig iron to Japan was a small phase of industrial life, and the present contract for 23,000 tons, of which 7,000 tons had already been delivered, could not have any material effect on the course of the Sino-Japanese dispute. There were no other contracts with Japan.

The secretary of the Port Kembla waterside workers, when informed of the Cabinet decision, said the men were adhering to the policy of "no pig iron for Japan."

Engineering Notes

COMMUNICATIONS

NEW MANCHURIAN LINE.—The Mukden, General Directorate of Railways announces the opening of provisional railway service a distance of 14.6 kilometers between Loaling and Huangpai along the Meichi Railway, construction of which has been mainly completed.

SINGAPORE ROAD WORK.—Forty miles of major road improvements, costing £250,000, will be made between the city of Singapore and defense areas on the island fortress during the next few years.

The plan provides for widening and straightening some of the most important roads outside the city area. Begun in 1937, the scheme is expected to be completed by 1946.

NEW BUSES IN CHINA.—The Central China Urban Motor Bus Transport Company has just received from Japan 60 chassis for their new buses, bodies for which are being constructed by the Marusho Jidosha Sho, Dent Road, according to the Shanghai *Mainichi*. After the 60 buses are completed in May they will be distributed in Nanking, Hangchow, Soochow and Chinkiang. Nanking will receive 30, the largest number.

TSINPU-RAIL BRIDGE.—Reopening of the Tientsin-Pukow Railway bridge, spanning the Hwai River, was marked by a celebration by Japanese military authorities and Chinese officials in an open area on the southern bank of the river on March 13. A reconstruction unit of the Japanese Ministry of Railways began engineering work on the bridge last October, and completed the task on Thursday. The bridge had been demolished by the Chinese at the time of the Hsuchow battle. A train was run over the bridge on a test trip last Friday.

CHINA PHONE LINE.—Direct telephone service between Japan, Korea, Manchoukuo and North China has been inaugurated. Under construction for two and a half years and completed only last month, the new circuit employed 10,000 men and cost Y10,000,000.

Connecting Fukuoka, in Kyushu, with Fusan and Seoul in Korea by way of Iki and Tsushima islands, the circuit extends to Mukden, Tientsin and Peiping. Its opening is expected to contribute greatly toward closer economic and cultural relations among the three nations.

LORRIES FOR CHINA.—A contract was signed in March in the Chinese Embassy in London between the Chinese Government and Messrs. John Thornycroft, for the purchase of 200 three and a half-ton and 100 seven-ton motor lorries, the latter to be provided with eight-ton trailers.

The total value of the motor lorries will be £223,011, including spare parts and break-down equipment to the value of £30,884. Payment is guaranteed by the Export Credits Department.

The lorries will be delivered at Rangoon, and the first shipment, consisting of ten light lorries, will be made in four weeks time. The first shipment of heavy lorries will be made in eight weeks.

NEW LINE FROM URGA.—Reports from Khokho, Suiyuan reveal that a 375-mile railway line linking Ulan Bator (Urga), capital of Outer Mongolia, and Kiachta on the Soviet-Mongolian border was completed at the end of last year. The new road is expected to increase Soviet influence in Outer Mongolia according to observers. War supplies, it is believed, will be sent into the interior of China by the line while coal and ore will be transported to the Soviet Union.

JAPANESE SHIPPING.—The number of merchant vessels under construction in Japan last year exceeded the number of vessels building in Great Britain, said Mr. Shozo Murata. President of the Osaka Shosen Kaisha, when addressing the general meeting of shareholders in Tokyo. In 1942, he predicted, the tonnage of Japanese steamships might reach 7,000,000, compared with 4,500,000 before the outbreak of the war in China. The present prosperity of Japanese shipping, he believes, will be increased by the economic bloc between Japan, Manchoukuo and China.

TIENTSIN BRIDGE.—A new bridge over the Pai River here, linking the Japanese and Italian Concessions in Tientsin is under construction by the Japanese army engineering corps.

When completed, it will be 345 feet long and 25 feet wide. It is expected to speed the flow of commerce throughout the area as well as to be military value to the Japanese army.

Simultaneously, a newly completed highway running through the British Concession, Special District Number 1, the Japanese Concession and the Chinese quarter is being paved by the public works section of the Provisional Government.

At the outset of the China incident, it is recalled, the Japanese military forces were handicapped in operations when the International Bridge was closed by order of the French Concession officials.

MINING

GOLD REGULATIONS.—In view of China's present " emergency," special gold mining regulations are being drafted by the Ministries of Finance and Economic Affairs. These Ministries are also planning the establishment of a gold mining bureau.

PHILIPPINE METALS.—Japan bought about 90 per cent of Philippines production of base metals in 1938, Government statistics published reveal. Japan bought 98 per cent of all Philippine Iron ore production totalling more than 900,000,000 kilos. More than 85 per cent of all Philippine manganese and copper also went to Japan.

YUNNAN MINING.—The Northern Yunnan Mining Company, recently formed by the Yunnan Provincial Government and the provincial natural resources investigation commission, was scheduled to start business on March 1, according to reports from Yunnan-fu. The company is capitalized at 2,000,000 yuan and mainly will engage in mining copper and zinc in the northern parts of the province.

EXPLORATION PLANNED.—In line with the Japanese Government's plan of mobilizing the nation's material resources, the Nippon Gakujutsu Shinkokai (Japan Academic Promotion Association) is planning to undertake the exploration of undiscovered mineral, coal and oil resources in Chosen, Taiwan and Manchoukuo.

Members of the South Manchuria Railway Company's research department and those of the Institute of Scientific Research of Manchoukuo are expected to co-operate with the Japanese scientists in the undertaking.

COAL IN MANCHURIA.—The total coal resources of Manchoukuo are now assessed at about 15 billion tons, which is more than three times the S.M.R. estimate, announced in 1932, of 4,800 million tons. At the time the Manchoukuo Government was founded, it announced that the Fuhsin coal deposit contined one billion tons, being named the " Saar of the Orient." It has been lately ascertained that the Fuhsin coal field actually contains nearly four billion tons. Furthermore, the coal deposits at Mishan Jalainor and Haokang are much greater than formerly estimated. The latest scientific surveys of other Manchurian coal fields also indicate the Manchurian resource in coal as amazingly large.

NICKEL IN THE URALS.—The construction of a big nickel works is being completed in the South-Urals, says Reuter's Trade Service from Moscow.

Very rich deposits of nickel ores were revealed in the Orsk-Khalilovo area in 1935. These ores also contain cobalt, the extraction of which will be started in the near future. In the same area large deposits of iron ore containing chromium, titanium and vanadium, were also found, which may lead to the turning of this area into one of the main centers of production of chrome and nickel steel. The nature of the deposits is such that they can be extracted by the open-cut method which, along with the mechanization of all the processes, greatly reduces the cost of the ore.

The addition of the South Ural works to the concerns already functioning and the forthcoming launching of the " Severonickel " plant and the Norilsk nickel giant, will, it is stated, convert the U.S.S.R. into an important nickel producer, completely freeing the country from imports of this metal.

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